COAL AGE

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Wars Are Not Won By Contraction

BY FLOYD W. PARSONS

AGENTS of Germany, if granted freedom of action here in the United States today, could not do more for the Kaiser than has been accomplished by those Americans who are daily advocating the curtailment of industry.

No man can win a race who starts in believing that he must slow down his speed to accommodate the pinch of a shoe that hurts. The wise runner would throw off the ill-fitting shoe and put on one that wouldn't hamper his gait.

Instead of correcting the weak link in our industrial life, which is transportation, we seek the easy way out and lay off all other effort, hoping that summer winds will come soon and blow away our troubles.

DIRECTOR GENERAL McADOO two weeks ago could not see the advisability of a freight embargo. Fuel Administrator Garfield consequently took the only step possible to relieve the freight congestion and shut down production. As a purely fuel-conservation measure, the closing-down order is not in any way justified. As a railroad remedy it did some good, for it permitted the release of hundreds of miles of cars that were blocked at many points. On the Chesapeake & Ohio R.R. there were 80 miles of cars loaded with coal, and 75 miles of such cars stood on sidings in the Pittsburgh district. Such congestions have been broken up, but an extensive freight embargo would have done the job better and cheaper.

Such a winter as this has not been known before. We were not prepared, and a crisis developed. The closing-down plan was ordered by the Fuel Administrator, but it was forced by the Railroad Director, who would not recognize the need of a general freight embargo. The "fuelless" Mondays would not have been continued, in spite of the hysterical protestations of several of the State Administrators, if Mr. McAdoo had consented to the embargo plan this week.

AS A result of the whole controversy, the United States today is trying to win its fight by poking with one hand instead of smashing with both fists. If the situation is so critical, then why not spend a few million dollars directly relieving freight congestion? Why not insist on a heavy demurrage charge? Why not build temporary terminal facilities and get the cars unloaded and moving? Why not notify consignees within something less than two weeks that shipments have arrived? Why not give two days' notice and discontinue passenger service 48 hours, repeating if necessary, using the passenger locomotives to increase freight-moving motive power? A few mail trains might be run with a passenger car attached to carry Government officials on necessary business. The biggest thing about this idea is the clear tracks thus provided for freight movement.

This is an extraordinary occasion, and it calls for extraordinary treatment. If the railroads have slowed us up, let us rather insist that they go faster and not that the whole Nation shall go slower. Exhilaration comes from breaking records; only dejection and discouragement result from curtailed effort. We talk of loaning money to other peoples; why not loan ourselves a little in a crisis? The more severe the weather conditions, the more men and money that must be employed.

WHAT is to be the effect of all this enforced idleness and reduced earnings on the next Liberty Loan? What is the effect of such a policy on the spirit of a people, 99 per cent. of whom submit but do not approve? What is to be gained by forcing a remedy on the railroads that they maintain is ineffective? Why assume responsibility for forcing restrictions that would have come automatically, been more equitable and less destructive?

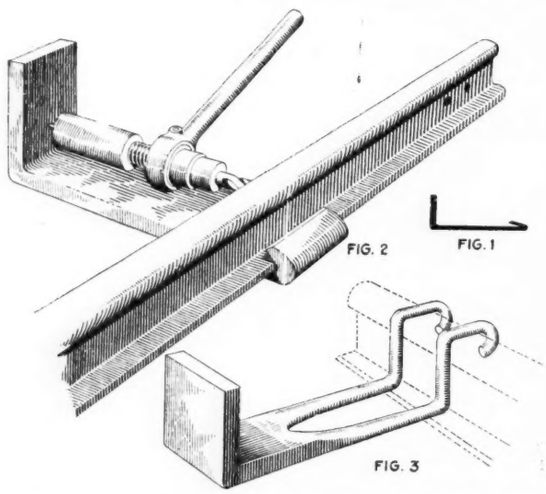
Mr. McAdoo has control of the railroads and at the same time is custodian of Uncle Sam's money. Congress wants to win the war and will pay to do it. The workmen of the Nation are a willing lot. There, Mr. McAdoo, is the formula—Railroads, Money, Men. The mines are working but three or four days a week, and the people are shivering in idleness. We ask you, Mr. Railroad Director, "What's the answer?" Isn't the solution in your hands?

IDEAS AND SUGGESTIONS

Rail Bonding and Drilling

BY FRANK HUSKINSON
Trinidad, Colo.

It is important in maintaining an electric haulage system in a coal mine to keep the tracks well bonded. Both rails should be bonded and cross-bonds put in at least every 100 yd. At all switches and frogs the circuit should be complete. This may be accomplished by the use of long jumpers of wire, bonded to the rails and run around the switch and frog. The system should be inspected regularly to see that this bonding is kept



FIGS. 1 TO 3. DEVICES FOR HOLDING A RATCHET DRILL IN PLACE WHEN DRILLING RAILS

in proper shape. A poorly bonded track is a source of grief and expense. In addition to causing delays and cutting down the output, it results in excessive heating of the fields and armature coils in the locomotives, in some instances causing these coils to heat to such a degree that the insulation becomes so badly charred that the coils will short-circuit within themselves and take an excessive amount of current. In a short time it then becomes necessary to rewind the armatures and replace the field coils.

At almost all mines there is a machine for drilling the rails for bonds and fishplates, but there are times and places where the machine cannot be used and it is necessary to adopt other methods for drilling the rails for bonds and bolts. For this purpose a ratchet drill and old man may be employed.

In Figs. 1, 2 and 3 are shown two good devices called "old men." I have used these for holding the ratchet drill when drilling rails. The old man shown in Figs. 1 and 2 is simple and handy. It hooks underneath the rail, and if the ratchet drill is set up on the outside of the track it can be left in place whenever a trip passes, as it is in the clear. The ratchet handle must be left lying flat, however, so as to clear the locomotive and cars.

The old man shown in Fig. 3 is hooked over the top of the rail and is only used in places where the other devices cannot be employed. This one has two prongs that hook over the top of the rail. These prongs are separated about 1 or 2 in. so as to allow the drill to operate between them. These attachments can be easily and quickly put on or removed from the rails.

I have also found it a good plan to have at least two of these devices the only difference in them being the length. One is for use with long drills and the other for short drills. This is more satisfactory than using blocking in a long attachment to compensate for a short drill.

Survey of Industrial Power Plants To Determine Coal-Burning Efficiency

BY F. H. SPARKS
Louisville, Ky.

The recent action of Dr. Garfield, the United States Fuel Administrator, in closing industrial plants on certain days will undoubtedly relieve the present serious shortage in fuel, but it will hardly correct some of the faults that are largely responsible for present conditions; and if suggestions for the permanent correction of almost criminal waste of coal as burned under many boilers in industrial plants are welcome, I suggest measures be put into effect which will place the burden of responsibility on those who through a "penny-wise-and-pound-foolish" policy have neglected to put their plants on an efficient fuel-burning basis, and who in a very large measure have contributed to this present condition of fuel shortage.

If A evaporates 10 or 12 or more pounds of water with every pound of coal burned, and B evaporates but 5 or 6 lb. of water with a pound of the same coal, the natural deduction is that something is wrong with B's plant, or with his method of burning coal; and before taking A's coal from him and dividing it with B, would it not be well to investigate the conditions of coal burning at both plants and learn why A evaporates twice as much water with a pound of coal as does B?

Any competent engineer can survey an industrial plant and determine just how much coal, efficiently burned, will be required to operate the plant.

Now, would it not be a good plan, and teach a lasting lesson, to have made surveys of all industrial plants using coal under boilers, to determine just the amount of coal necessary to operate each plant, and then allow each plant per day or week or month, just the amount shown by the survey as necessary?

For instance, if a plant has been burning 1000 tons of coal per month under inefficient methods, and the survey shows that, efficiently burned, 500 tons would carry the load, then say to the manager of that plant: "Efficiently burned, 500 tons of coal per month will

carry your load, and we will allow you just that amount. If you care to burn up 500 tons in half that time, you may then shut your plant down—or use the balance of the time to put your plant on an efficient coal-burning basis."

The chances are good that the man who is burning coal efficiently is also operating his whole plant efficiently, and his is the plant that should be permitted and encouraged to operate continuously. Therefore, I suggest an investigation of the methods of burning coal under boilers in all industrial plants, and the instituting of corrective measures wherever waste is shown.

Safety Switch Boxes

By Electrical Engineer

A wise provision of the state law in regard to the electrical equipment in and around a coal mine is that all electric switches shall have a suitable guard or protection around them, making it impossible for any person to come in contact with the metal parts of the switch. In order to comply with this law, I made up quite a number of safety switch boxes, as shown in Fig. 1. This is the cheapest and most reliable safety switch box I know of. It consists of only six pieces of fireproofed wood—the back, two sides, the front and the two-piece top. The switch is mounted on the back

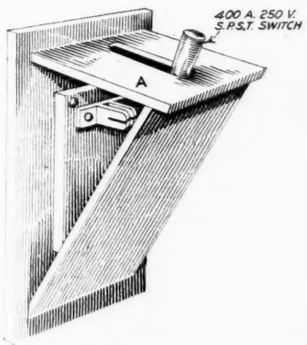


FIG. 1

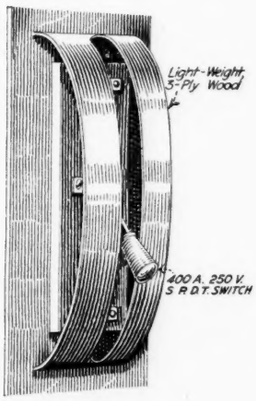


FIG. 2

FIGS. 1 AND 2. TWO TYPES OF SWITCH BOXES THAT ARE SAFE AND ECONOMICAL

board, while the top pieces are so fitted as to allow only sufficient room for the handle of the switch to operate in. In this style of switch box only the wooden handle of the switch is visible, and this is the only part of the switch that can be taken hold of.

In Fig. 2 is shown a safety box for a double-throw switch. This is an excellent switch box for this type of switch. The back and sides are made of plain fireproofed wood, while the front is constructed of three-ply light-weight built-up board. This material is flexible and can be shaped easily. A slot is cut in the front just large enough to allow the switch handle to project through. This makes a safe and reliable switch box.

These two switch boxes were devised after a series of experiments with various kinds of guards and boxes, and were only adopted as standard after they had proved themselves successful and had passed a rigid examination by the mine inspectors. The boxes are given two coats of paint. This results in a neat appearance and prevents the wood from absorbing any moisture.

I have found it a good idea to give all switch bases a coat or two of shellac. This prevents the slate from absorbing moisture. I have had trouble with slate bases absorbing moisture, this causing a considerable leakage of current across the switch terminals; not enough to light a lamp, but enough so that a person or a mule coming in contact with the trolley line would receive a severe shock. I have found that the use of shellac will prevent this leakage. It is therefore recommended that all switch bases be given two coats.

The use of untreated asbestos for lining switch boxes is satisfactory in dry places; in damp places the asbestos should be given at least two or preferably three coats of shellac to prevent its absorbing moisture. Another good idea is to have a lamp burning at all times inside the switch box or cabinet in damp places. This gives a visual signal that the current is on and keeps the switch box dry and safe.

One of the rules in installing switches that is often overlooked is that a knife-switch should always be placed in such a position that the blade will have a tendency to fall out, or open. Always connect the live, or positive, side of the line to the stationary contact of a switch, never to the blade, or hinged, part.

The Issue of the Day

By Robert Littlehales
Smithton, Pennsylvania

Coal mining, like other industries, has advanced rapidly in the last few years. It has kept pace with the times. Modern equipment, systematic extraction and efficient management have replaced the crude methods of former days.

A mine official's training, today, should embody more than mere practical knowledge. I will admit, however, that it is essential; but without technical training an official is greatly handicapped. The combination of the two makes him a more efficient manager; consequently, he is more qualified to take care of any situation that may arise.

The past few years have brought about considerable mechanical changes in coal mining, but there is still a greater movement of a similar nature on foot. The coal-mining industry is fast approaching a revolutionary state. Too much handling of coal is still required; some kind of mechanical conveyance would remedy the evil. In any crisis or difficulty, whether it be political, religious or industrial, there are always some who will arise and meet the issue, bringing about victory from defeat and success from seeming impossibility.

Necessity is the mother of invention; likewise opportunity is the maker of men. What are you doing to meet the issue?

In Canada the Coal Content of the Western coal beds is estimated to amount to 1,217,386,000,000 tons, of which 830,000,000 tons are anthracite and semi-anthracite, 282,313,000,000 tons bituminous, 847,821,000,000 tons sub-bituminous, and 86,422,000,000 tons lignite. This coal is found in the geological ages between the lower Cretaceous and the Tertiary.

Preparing No. 3 Pocahontas Coal

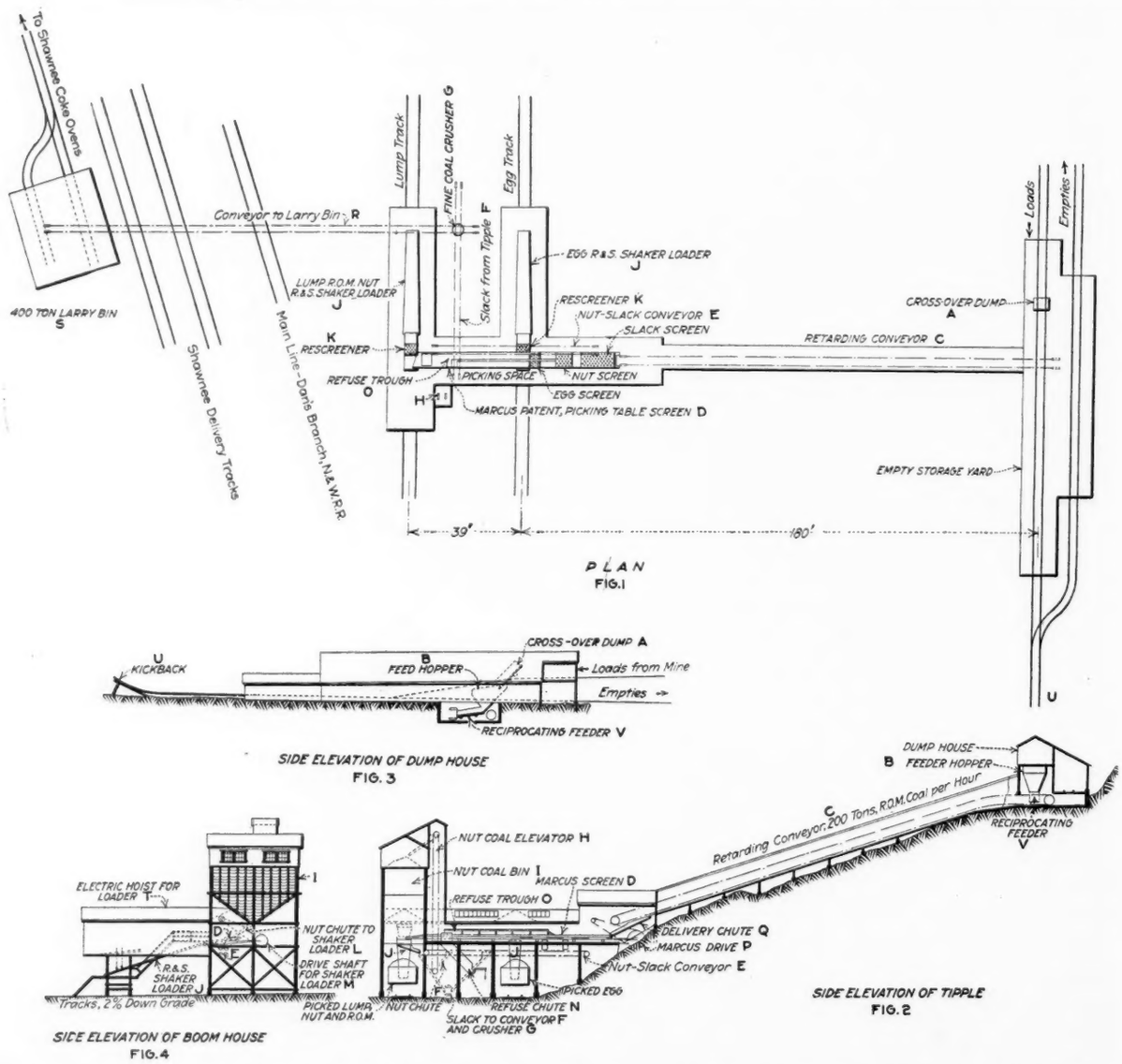
BY RICHARD G. MILLER
Chicago, Ill.

THE Pulaski Iron Co., of which Percival Johnson is general manager at Pulaski, Va., and Floyd E. Cunnyngham is superintendent of coal mines, has been operating its coal property of approximately 1400 acres at Eckman, W. Va., for more than 25 years. The plant, including the entire top works with beehive coke ovens, handles the entire output, and until recently over an inadequate tipple, containing various types of screening, picking, conveying and elevating machinery unsuitable and, for the most part, unnecessary in modern preparation.

This company is generally recognized in the "Pocahontas Field" as being progressive but, at the same time, wisely conservative. Handicapped by the improper kind of equipment for cleaning and preparing No. 3 Pocahontas coal (one of the most friable coals known), and having an existing plant of large proportions, it faced a problem which called for increased capacity and simultaneously the best preparation possible to obtain.

It also became necessary to increase the coke-oven capacity. This naturally required a larger tonnage of run-of-mine coal over the preparation plant. The company was enabled to acquire the coking facilities of the Shawnee Co. nearby, increasing the annual coke output from 100,000 to 150,000 tons. Arrangements were accordingly made to deliver the necessary crushed coal to that point as well as to continue supplying the ovens on its own site, as formerly.

The type of preparation plant and machinery adopted was the result of a thorough investigation, locally and in other fields, with the idea of getting a modern plant



FIGS. 1 TO 4. GENERAL ARRANGEMENT OF PLANT, INDICATING TYPE AND CHARACTER OF CONVEYING MACHINERY

that would reduce maintenance and labor, and at the same time increase efficiency. Moreover, it was important that the building and installation of the new plant closely adjacent to the existing structures should not interfere with continuous operation.

The following descriptions and explanations illustrate the type and character of machinery adopted to fulfill the special conditions and meet the needs of the Pulaski company. This plant effects the saving of ten men in its operation over the old plant. The entire new plant is electrically operated with 250 volts direct current, generated locally.

The general arrangement is clearly shown in Fig. 1. The new equipment immediately adjoins the existing plant, the retarding conveyor *C* being but 50 ft. away. Trips of loaded mine cars are delivered to the dump-house, Fig. 3, over the Phillips crossover dump *A*, and thence to the kickback *U*, which in this case is of unusual proportions because of the fact that the grades had to be worked in with the existing haulage systems from three mine openings. This feature had the attendant advantage of providing a storage yard for empties, which greatly facilitates operation.

Run-of-Mine Delivered by Reciprocating Feeder

In the side elevation of the tipple, Fig. 2, it may be noted that run-of-mine coal is delivered from the feeder hopper *B* to the retarding conveyor *C* by the reciprocating feeder *V*. This is so constructed as to inclination, mechanical features and speed that it prevents leakage of fine coal at the rear end.

The retarding conveyor *C* is composed of two strands of standard, long-pitch, steel-thimble roller chain, carrying strong steel flights that control the travel of the coal and permit its easy delivery over the chute *Q* onto the Marcus patent picking table screen *D*. This prepares four sizes and at the same time enables pickers to remove refuse and dispose of it onto the refuse trough *O*, over which it is conveyed to the refuse chute *N* for disposal by carts.

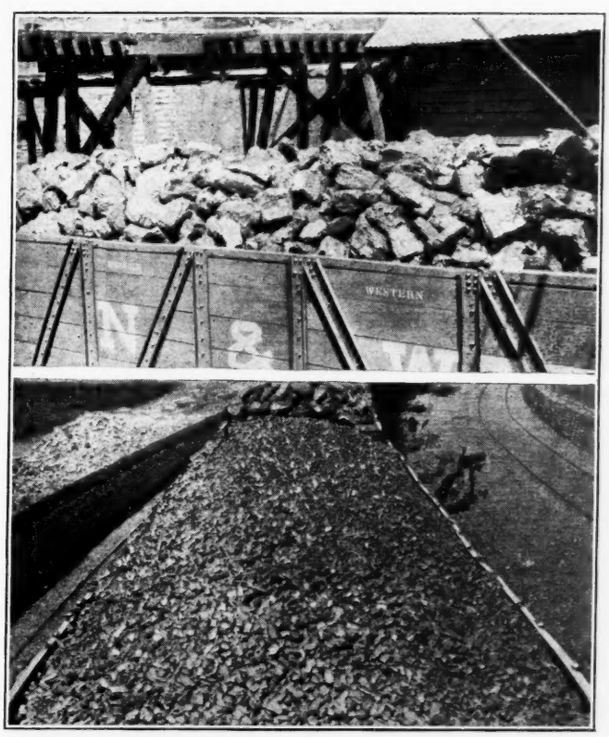
The Marcus, in conjunction with the "Rands" shaker loaders *J*, Fig. 4, made possible the simplicity of design which would have been very difficult to obtain by other means. On the screen, the coal passes successively over 1⅝ in., 2 in., and 4 in. in diameter circular perforations, as well as the blank picking spaces where the pickers thoroughly clean it and remove all impurities, which they dispose of as described in the foregoing. This conveying trough *O* is rigidly connected to the screen *D* so that it has the same conveying motion.

The preparation of nut coal in this plant is accomplished in an unusual manner. This material is delivered from the Marcus to the nut-slack conveyor *E*, directly beneath. This conveyor is made with two compartments, one carrying nut coal and the other slack. The elevator *H* receives the nut coal from one compartment of the conveyor *E* and delivers it to the bin *I* where it is stored, since the quantity is relatively small. When it is desired to ship this nut coal, the nut chute to the loader *L*, Fig. 4, is opened and the loader on the lump track lowers it gently into railroad cars. In passing over the loader *J*, the rescreener *K*, Fig. 1, removes the fine coal made in handling so that an excellent quality of nut is prepared for shipment. This is illustrated by Fig. 6. The "Rands" shaker loaders *J* each consist of an upper and lower section balanced against each other. They possess few wearing parts and because the coal is placed (not dropped) into the railroad cars at a low point they cause a minimum of degradation.

The upper sections do not raise or lower, but the lower, or boom, sections are raised by the electric hoists *T* as the railroad cars fill. Both sections receive a reciprocating motion from a drive shaft actuated by an electric motor.

On account of No. 3 Pocahontas coal being of an extremely friable nature, sections of perforated plate called rescreeners (*K*) were inserted in the upper sections. The coal is thus given a final rescreening in lump, egg and nut sizes just before passing into railroad cars.

All the slack screened from the run-of-mine (also all rescreenings from the nut, egg and lump) is carried by



FIGS. 5 AND 6. KIND OF COAL PREPARED BY PLANT

the conveyor *F* parallel to the lump track and reduced in the crusher *G* to ⅜ in. for coking.

To deliver slack to the newly acquired Shawnee ovens, the conveyor *R* was built through a concrete tunnel under the railroad tracks and thence on a 30-deg. incline to the 400-ton larry bin *S*, shown in the plan view, Fig. 1. This conveyor *R* handles the ⅜-in. crushed slack at the rate of 100 tons per hour so that the Shawnee supply can be easily maintained and the balance of the stream of slack diverted to the old plant, as in the past, for reduction in another crusher for use in the original Pulaski ovens.

The entire new plant (including all the units illustrated in Figs. 1 to 4 inclusive) was designed and built by the Roberts & Schaefer Co., engineers and contractors, Chicago, Illinois.

The Briquetting of Anthracite*

By W. P. FREY
Fuel Engineer, Lehigh Coal and Navigation Co., Lansford, Penn.

SYNOPSIS — *Briquetting of anthracite culm or silt, up to a few years ago, was not a financial success. The introduction of the Dutch oil process and certain improvements in equipment have altered this situation. Silt of a proper quality may now be briquetted at a substantial profit.*

THE briquette plant of the Lehigh Coal and Navigation Co., at Lansford, Penn., has been previously described. Fighting its way like the pioneer of early days through trials and discouragements, it has passed the stage of experiment and has become an institution resting on a foundation practically and financially sound. How the goal was reached it is the purpose of this paper to show, and explanation will be made as to why success was easier along the roads finally chosen. An attempt will be made to set standards for the development of hard-coal briquetting that will eliminate future failures.

All conclusions here drawn are based upon actual facts and achievements, and therefore all speculation and theorizing have been avoided. It is hoped that this article will awaken interest that may positively and successfully answer the call of national emergency—the necessity for fuel.

New Method Did Away with Fumes

Up to three years ago, the Lehigh Coal and Navigation Co. made hard-coal briquettes, using coal-tar pitch as a binder. The plant operated with a monthly output of from 300 to 600 tons and was unable to meet its own expenses. Naturally no one was satisfied, especially as the ideal of a smokeless briquette was still unrealized. Then came the Dutch oil process, introduced into this country by the General Briquetting Co., of New York. This process uses a small percentage of heavy petroleum residuum as a binder. This, being liquid, achieved great economy of handling and did away with the fumes.

This oil (called "Hydrolene" 160 deg. melting point) is not absolutely smokeless; in fact, the heating up of a fresh supply of fuel to the temperature of red heat liberates low-volatile hydrocarbons that produce a white smoke. This is, however, not objectionable. On the other hand, this oil adds to the briquette about 7 per cent. of volatile matter, making the product so far as heat content is concerned the equivalent of the best free-burning anthracite coal.

The average silt used in the manufacture of these briquettes, or boulets, averages 16.5 per cent. chemical ash, corresponding to 12,000 B.t.u. per pound of coal. The hydrolene used as a binder runs about 17,500 B.t.u. per pound, and approximately 7 per cent. of it enters into the mixture, hence:

$$12{,}000 \times 0.93 = 11{,}160 \text{ B.t.u.}$$
$$17{,}500 \times 0.07 = 1{,}125 \text{ B.t.u.}$$

Total B.t.u. = 12,385 per pound of briquetted coal.

The gain over the original coal is 385 B.t.u., or, in other words, the net gain in heating value amounts to 3.2 per cent. Thus, the briquetted anthracite averages 12,385 B.t.u. per pound, and contains 12 per cent. volatile matter and 16.5 per cent. chemical ash.

This is a most valuable fuel; it is the best fuel in its adaptations to the requirements of the kitchen range, from the small household to the large hotel, be it for cooking, baking or broiling; it is an excellent fuel for the hot-air furnace and steam boiler; it is a good fuel for general purposes and has successfully replaced, around the mines, the bituminous coal necessary for the operation of certain classes of steam shovels, steam rollers and mine locomotives. It has been tried out on the heavy freight engines of the Lehigh & New England R.R., in narrow, semi-wide and wide fireboxes, and has always shown steaming qualities equal to the best free-burning coal of the same ash content.

Briquettes May Be Mixed with Soft Coal

Of course, even the free-burning coal cannot replace high-grade bituminous in the firing practice of locomotives, but the briquettes may be mixed half and half with such coal, either mechanically by introducing anthracite briquettes into soft coal, or more intimately by briquetting a hard-soft coal mixture. This 50-50 mixture will burn with the same steaming qualities and efficiency of combustion as the original bituminous coal. The mixture can even be compounded in the proportion of 15 per cent. bituminous coal and 85 per cent. briquettes, but in this case the consumption will be greater by 15 to 25 per cent. for the same rating. Several instances could be cited where factory owners, unable to secure coal for their bituminous-coal boilers, had to replace it entirely by anthracite briquettes, and did so without materially increasing their fuel bill.

The anthracite briquette as a fuel does not mix with straight anthracite coal. As is self-evident, the anthracite briquette must be made of a raw material of such low ash content as will prevent clinkering. In general this result will be secured if the ash content is kept below 18 per cent. Emphasis must be laid upon this particular point, as such requirements exclude from direct briquetting most of the large anthracite culm banks now available at the various mines. It is a consideration of prime importance in the successful manufacturing and marketing of this new product. Not until lately has it been possible to develop machinery that will practically and cheaply furnish such silt as is required. The Lehigh Coal and Navigation Co., using a combination of cone separators and shaking tables, has been entirely successful in solving this problem. It is almost unnecessary to add that the briquette made from hard coal and hydrolene is waterproof, tough and hard. This results in minimum breakage in loading and dumping.

The balance of the problem of successful briquetting requires purely mechanical engineering only. The remodeled Lansford plant serves as an illustration. The output of any similar installation is limited by the capacity of the presses. In this case it is 40 tons per

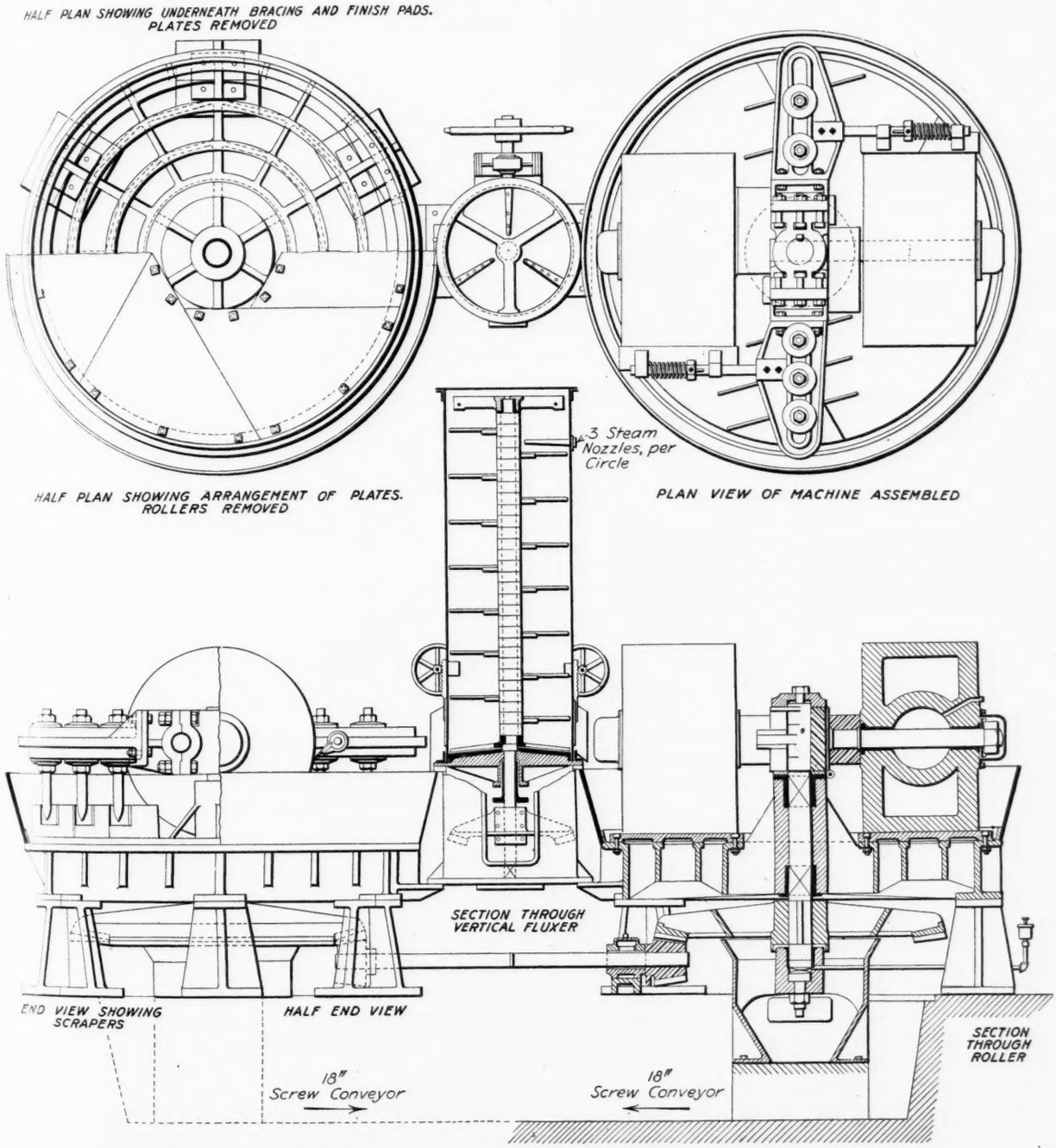
*Paper to be read at the American Institute of Mining Engineers, at its February meeting, New York City.

hour. Forty tons per hour will thus dimension the dumping arrangements, the driers, the mixers and the presses. Much care should be exercised in the choice of a dumping arrangement; it should be light enough to be entirely automatic and heavy enough to stand the wear and tear of the rubbing of the coal and the corrosion of the acid water. It should be arranged to be frostproof, well drained and easily accessible.

The steel dumping hopper is provided with an adjustable gate. The bottom of the hopper is formed by a steel apron feeder, which dumps the coal on a V-bucket elevator. This in turn takes the coal to the top of the drier building and dumps it into steel chutes leading to the two driers. The apron feeder has a speed of 30 ft. per minute. The V-buckets are each 15 x 16 in., rigidly mounted on No. 1112 Link-Belt chain; their speed is 80 ft. per minute.

The two driers are of the rotary single shell type, 36 ft. long and 6 ft. 5 in. in inside diameter. They are pitched $\frac{3}{8}$ in. per foot. The number of revolutions is 11 per minute. This arrangement is simple and cheap but has the disadvantage of sending a heavy black cloud of coal particles up the stack. This can only be prevented by dust collectors or incomplete drying. The fuel used for the drier furnace is No. 3 buckwheat. So efficient is the arrangement, that under good conditions 70 tons of culm are dried per ton of coal burned. A screen attachment at the end of the driers removes all oversize and foreign material.

The dried coal is fed directly into two double-strand



BIG CHILEAN MILL MIXER WHERE COAL AND BINDER ARE GROUND INTO INTIMATE CONTACT

continuous bucket elevators with steel casing and 12 x 8 x 12-in. buckets, and delivered to two dry-coal bins of 100 tons capacity each. Sufficient silt is always kept in cars outside of the plant to insure continuity of operation. The contents of the dry bins equalize the dry coal supply to the mixers and presses, and eliminate fluctuations due to time lost in dumping cars or to machinery breakdowns in the drying plant. Fifty horsepower is required to drive the driers and dump.

The culm being now dry, special attention must be paid to the prevention of undue dust. As dry-culm carriers, screw or belt conveyors only may be used, and these must be inclosed in dustproof casings. Both types of conveyors have their advantages and disadvantages. Belts always drop coal on the under side, and provision should be made so that this waste material may easily be removed or recovered without loss of time. Screw conveyors can be used advantageously for either wet or dry silt. Such conveyors, over 100 ft. long, are in use and give little trouble. However, belt conveyors are found preferable because they are lighter, cheaper and faster.

How to Handle the Hot Mixture

From the dry-coal bins the coal should be delivered by the shortest possible route to a mixer, where the hot oil can be thoroughly mixed with it. A preliminary purely mechanical mixing of oil and coal is done in a slightly inclined paddle mixer 3 ft. long. This mixer measures 20 in. over the paddles and its number of revolutions is 75 per minute. The oil is fed in at a temperature of about 250 deg. F. The coal is at a temperature of about 100 deg. The handling of this hot oil and coal mixture presents some difficulties, since in chilling the oil becomes sticky and naturally will adhere to metal as well as to coal. There are different ways to overcome this. At 250 deg. F. the oil will flow like water; at about 70 deg. F. it becomes hard and brittle; at about 175 deg. F. its sticking qualities are most pronounced, while at 135 deg. they disappear. It is necessary, therefore, to either keep the coal and oil mixture at temperatures close to 200 deg. F. or else hold the coal and oil mixture around 150 deg., keeping the shell and metal parts so cool that in contact with them the oil chills immediately to a nonsticking mass. This latter method has been chosen in the Lansford plant, though for reasons of ecomony the mixture should be kept hot, and it is expected to improve this machinery to the point where it will be possible to successfully handle a hot coal-and-oil mixture.

The paddle mixing trough is kept cool by a steady flow of cold water. This water enters into the mixture as surface moisture and then helps make the mass flow more freely. From the short paddle mixer the coal-and-oil mixture is discharged to a vertical paddle mixer, or fluxer, so called because here, in addition to mechanical mixing, a moistening and heating effect is obtained, which brings the mass to the plasticity of a perfect flux, hot enough to be adhesive and moist enough to make handling easy. The flux then passes through the masticator, a Chilean mill of huge dimensions, where a thorough intermixing of ingredients occurs.

The use of the masticator is the backbone of the patents covering the Dutch oil process. It could be eliminated, but the saving in royalty is generally offset by the cost of additional oil necessary. The masticator makes 20 r.p.m. It is built either in single or twin-unit types, local conditions will determine the choice. Twelve and one-half tons of material per hour are efficiently masticated. One hundred horsepower will drive the single-unit type and 150 hp. the twin-unit type of this machine. The masticator discharges centrally through a horizontal 12-in. screw conveyor, operating at 60 r.p.m., to the presses.

The vertical feedbox on top of the press contains a vertical stirrer which keeps the flux in motion, insuring equal and continuous feed. The press shafts should be well dimensioned, as they often break from fatigue. The type of press used in this plant is known as the "Belgian eggette press." The choice of this machine is the result of investigations covering several other types of presses. The peripheral speed of the press rolls is 80 ft. per minute. The die rings are either steel, cut and milled, or chilled cast iron.

The output of each press is now over 10 tons per hour. This increase from four tons to ten (the original guaranteed press output having been four tons per press per hour) was a vital factor in the success of the plant.

As the briquettes leave the press warm, some care has to be taken in handling them until they are sufficiently cooled to become hard. At this plant the boulets drop onto a 24-in. belt conveyor and are taken to a rotary screen, where all waste breakage is removed and sent back to the presses. The boulets leaving the rotary screen are delivered by a single 24-in. belt to a double-strand continuous bucket elevator with 18 x 8 x 12-in. buckets, which in turn discharges into a 300-ton pocket with a perforated screen bottom. Here sufficient time is allowed them to cool before being loaded into cars. During the hot season this cooling process is accelerated by water sprays. Breakage through storing and loading amounts to less than 2 per cent.

Ample Storage Capacity a Necessity

The handling of the oil requires special steam-heated installations. As the oil is a manufactured product, provisions should be made for ample storage capacity, amounting to at least a two-weeks' supply. Any kind of insulated tank will answer the requirements, provided there is a good nonleaking radiator arrangement with a temperature control. Oil should not be kept too hot or its melting point will rise due to evaporation of its volatile constituents. A 70,000-gal. tank is being used at Lansford, as the main storage unit, with the oil at 180 deg. F. A 12,000-gal. tank is employed for direct use, with the oil at 275 deg. F. A steam-heated, electrically driven Kinney pump maintains circulation in the oil system and has satisfactorily answered all purposes. It has been in continuous service for over two years.

Generally speaking, all oil lines have to be steam-heated. This is done by running 1-in. steam lines beside the oil lines (not smaller than 2 in.) and wrapping the two together with good insulating material. Only quick-closing gate valves should be used. In order to have a uniform flow of oil, an overflow feeder tank is provided where the mixing of coal and oil is performed. By keeping the tank full constant head is obtained. A steam-heated gate valve will give the necessary adjustment facilities. Much attention has to be paid to the

good working of this outfit, as the cost of oil is the biggest single item entering into the manufacturing cost of boulets.

At the present market prices and wage scales, the following cost statement applies to the manufacture of hard coal briquettes per ton:

Oil binder	$1.25	Depreciation	$0.20
Clean silt delivered at plant	1.00	Insurance, compensation and taxes	.05
Superintendence and labor	.40	Royalty	.10
Power, light, heat and water	.15		
Supplies	.05		
Maintenance	.05	Total cost per ton	$3.35
Interest on investment	.10		

These figures, though conservative, will give ample protection to the prospective manufacturer. A plant such as this represents at the present market prices an investment of $250,000, exclusive of ground and tracks. The boulets find a ready market at $4 per ton, leaving a comfortable margin of profit available.

Unusual Method of Drainage

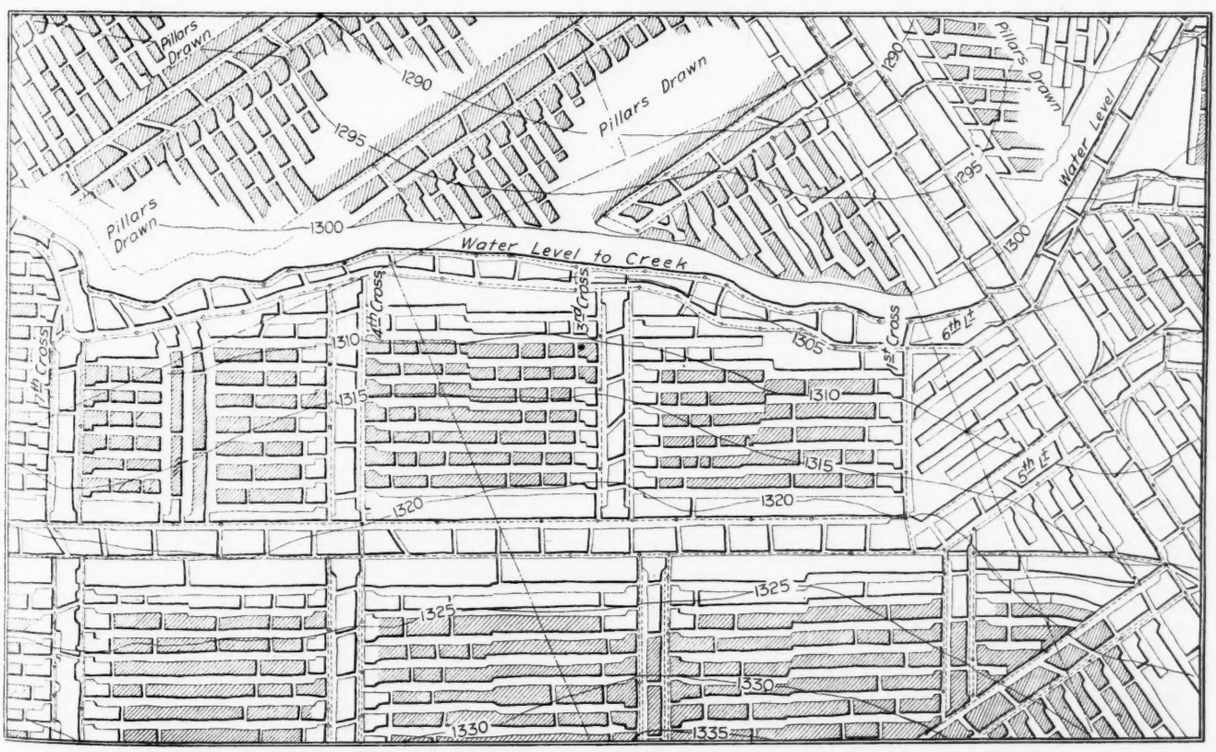
At one of the mines of a large coal company in central Pennsylvania the main slope was driven from the highest point on the outcrop of the coal instead of the lowest, as is usually the case. The point at which the opening was made was selected because it was nearest to the railroad which controlled the mine, while the lowest point, where the coal outcropped on the property, was on another railroad four miles away. Even if the mine had been opened at the lowest point about one-half of the operation would have been below the drainage level. After operating the mine for a number of years, the quantity of water handled by the pumps, particularly during the spring, became so great that some other method of drainage had to be devised.

It was known from the outcrop survey that the lowest point on the outcrop was about 100 ft. below the slope opening. A drift was started here. The main slope was extended until it reached the level of the new drift opened from the outside. Two drifts on this level were then started from the main slope, one to the right and the other to the left. These drifts and similar drifts at three other slopes in adjoining mines of the same company were then driven, the floor being kept level. These drifts were driven until they joined, making a water level connecting all four mines draining to the outside. Practically all this work was in virgin coal. A pillar of solid coal, 100 ft. thick, was left on the lower side of the water level, the only breaks in the pillar occurring where the main slopes from the mines pass through it.

Later it was found that there were some parts of the water level that had bad roof and the upkeep of which was too expensive. These places were lined with concrete, and in some cases rock tunnels were driven. As the workings of the mine progressed, cross-entries were driven on the upper side of the water level to connect these workings with the water level.

Most of the coal has now been taken out from the upper side of the water level and almost all of the workings are below it. All of the worked-out portion of the mine is drained into this water level, and in normal weather a stream of water that would fill a 24-in. pipe flows through it. In rainy seasons the water is 3 ft. deep. A part of this water level is shown by the heavy lines in the mine map below.

The main slope has now been driven in 2½ miles, and the same system is now being installed to drain all the water between this new water level and the upper water level. Instead of being drained to the outside, the water is carried to a pump and from there it is pumped to the surface by three 600-gal. Morris centrifugal pumps.



MINE MAP, SHOWING WATER LEVEL AND DETAILS OF DRAINAGE METHOD

Efficient Coal-Mine Gatehouse

By R. M. MAGRAW
General Superintendent, Utah Fuel Co., Hiawatha, Utah

THE foreword in the Dec. 8, 1917, issue of *Coal Age*, "The Coal-Mine Gatehouse," appeals with peculiar force to me, as undoubtedly it does to many others of the coal-mining fraternity who have had experience at mines where the gatehouse, or check cabin, was considered an unnecessary luxury or bill of expense. Many companies claiming to have efficient checking systems have overlooked the salient features which the name usually denotes.

The mere fact that the employee is required to hang a check on the board when entering the mine and to remove it when coming out does not spell that state of preparedness and efficiency mentioned by the editor in the last paragraph of the foreword mentioned above, as such a practice only serves to indicate the number of men in the mine and does not follow out the main objects of a checking system as they are contemplated by the editor.

Where a single check is hung on the board at the beginning of the shift and removed at the quitting time of the individual, the system breaks down, to quote the foreword, "in that day of disaster which every mine operator hopes he'll never see," in that it cannot be of assistance in identifying the unfortunates.

I have seen some very elaborate checking systems where celluloid checks of different colors were used to segregate the labor into classes. The complications arising from too much system, however, and the inflammability of the celluloid itself, detract from the value of such installations.

The effectiveness of any checking system is governed by its addition to the safety of the employees, to the efficiency of the organization, to the ease and economy of its operation, and to the value of the information which is compiled from the records of the checkman.

Gatehouses can be made as expensive as the resources of the company will permit. They can also be economical of construction and at the same time embody most of the essential features of the more costly installations. Such a structure, as standardized at the mines of the United States Fuel Co., at Hiawatha, Black Hawk, Mohrland and Panther, Utah, will be described. The building itself is of no particular interest, except to show that a satisfactory arrangement can be secured at moderate cost; but it is believed that a description of the system involved may prove of value.

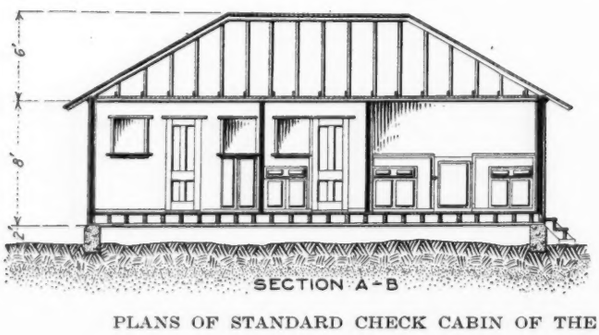
The building is of frame and galvanized-iron construction, and a glance at the accompanying floor plan (Fig. 1) will serve to show the arrangement of the interior. The building is located about 20 ft. from, and to one side of, the manway entrance to the mine, so that in case of a disaster it would be in the clear.

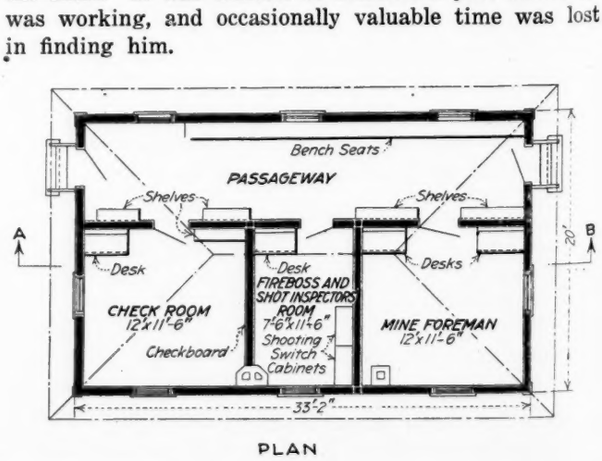
The employee enters at the end of the building farthest from the mine, passes by the office of the mine foreman, who, if necessary, issues instructions relative to the day's work, care of working place, etc.; then by the fireboss' window, where the condition of his working place as regards safety is given him, as are also any instructions relative to immediate safety precautions; then finally past the check window, where he has delivered to him a circular aluminum check bearing his number, which he is required to carry at all times while in the mine. A square brass check, containing the same number, is hung over his space on the checkboard at all times as long as he remains in the employ of the company. When he leaves the mine he returns his aluminum check, which is hung over the brass check.

This system shows the checkman, foreman or other officials at a glance the number of men working and the number idle, and at the end of the shift the board shows the men who have checked out and those still remaining in the mine.

It being a strict rule that no shots shall be fired while men are in the mine, all the shots being fired electrically by a switch located in the check cabin, the checkboard is a necessary feature. If John Jones, or, as it is more apt to be, John Pappadametropopoulos, goes home without delivering his check it is up to the shotfirer to locate him before throwing the shooting switch. Formerly it took an hour or more to locate him, due to his proclivity to change his domicile without leaving any forwarding address. The fact that he was charged a dollar for his forgetfulness, which went to a fund to furnish the children of the camp with a treat on the Fourth of July, did not pay for the loss of time and efficiency.

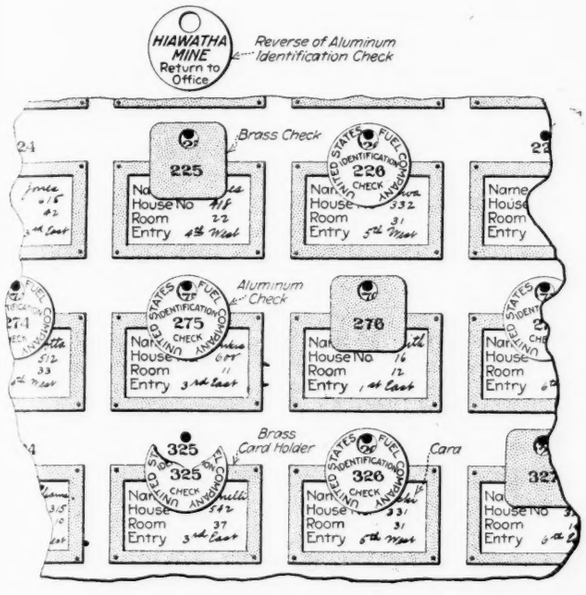
It very often happened that a telegram or other urgent message would come for a man while he was in the mine. It was difficult to remember just where he was working, and occasionally valuable time was lost in finding him.





PLANS OF STANDARD CHECK CABIN OF THE UNITED STATES FUEL CO., HIAWATHA, UTAH

In order to make it easy to locate a man either in or out of the mine, a card system has been inaugurated, which has in a large measure solved the difficulty. Under each check number a brass cardholder has been tacked in which is fastened a card 1½ x 2½ in. The card is given to the man at the office, where he signs an application and gets a check number, and contains his name, occupation, residence and working place. This is of great assistance to the foreman, boss driver and



PORTION OF UNITED STATES FUEL CO.'S CHECKBOARD

others, as at a glance the number and location of idle places can be determined, and the day's campaign laid out accordingly.

The wall space in the passageway is used for hanging miners' coal checks, for posting safety-first signs, bulletins, etc.

The checkman is paid by the month, and in addition to his duties as checkman he issues powder to the miners before they enter the mine. After all men have checked in, the checkman takes a tally of the board, noting in a record book the number of loaders, pick miners, machinemen, drivers and other classes of labor at work that day. Each individual is entered separately, and at the time he checks out the number of hours worked is entered.

Anthracite Operators Take Hold

The following circular notice was issued Feb. 4, by the General Committee of Anthracite Operators, Lafayette Building, Philadelphia:

A special representative committee was appointed Feb. 1 by the anthracite industry to work out and give effect to a constructive program for the increased production and more equitable distribution of coal. It held its first meeting in Philadelphia today. The committee consists of Joseph B. Dickson, of Dickson and Eddy, New York; W. J. Richards, president, Philadelphia & Reading Coal and Iron Co.; S. D. Warriner, president, Lehigh Coal and Navigation Company.

What is being attempted is done with the knowledge and approval of the Federal Fuel Administration. The anthracite operators are coöperating with the Fuel Administration and the Government authorities in every way possible in the hope of meeting the difficulties of the current situation, and they are looking ahead to prevent similar trouble next winter.

A plan has been roughly outlined and adopted and it will now be worked out in the detail necessary to make it practically effective. It aims to establish a central organization through which a complete coöperation of all anthracite producers may be obtained. This will coördinate with the Federal Fuel Administration and the Director General of Railroads, the purpose being to accomplish the following ends:

1. To provide an increased production of anthracite.
2. To take such measures as may be necessary to maintain the standard of the coal produced and to restrict the sale of any output unsuited for economic use.
3. To prevent the substitution of bituminous coal and coke by anthracite, which substitution cuts down the available supply of anthracite to anthracite consumers.
4. To catalog the war requirements of the Government for anthracite.
5. To determine the needs of the consuming public throughout the territory in which anthracite is normally used.
6. To apportion the output of anthracite by districts, cities and towns, to the end that each shall be assured of its fair supply.
7. To route the anthracite from points of production to points of consumption by traffic lines that will afford distribution on the quickest and most economic basis.

The above forward-looking plan cannot be given full effect immediately. But while it is hardly possible to have it completely operative before Apr. 1, the purpose is to get it working as fast as possible, and in the meantime to meet the general need and specific needs so as to afford the greatest relief.

The committee of three is getting the data necessary for the practical working of the plan. It will be perfected in detail and submitted to the Federal Fuel Administrator as quickly as possible. It is expected that the adjustments made will cause a material increase in output and a better distribution of anthracite. When the coal gets to points of consumption it will be for the local fuel administrators to see that it is equitably distributed and not wasted or diverted into channels not intended. When the coal reaches the retailer the operators, as producers and wholesalers, have no control over it.

Why Concrete Tanks Fail

Old chain, wire rope and like materials are unsuited to tank reinforcement as they cannot accurately be placed in the forms nor kept in proper position while placing concrete. However strong such reinforcing material may be in itself, says "The Ransome Book," the effectiveness of it is not secured when used in reinforced-concrete tanks or similar structures. For small concrete tanks mesh fabric may be used, but large tanks require suitable sizes of steel rods and bars. Tanks which are made from concrete lean in cement, or from ill-proportioned mixtures or which are made from concrete placed either too wet or too dry are apt to be leaky. If the newly placed concrete is not protected from drying prematurely, the result is similar.

Coming Meetings

American Institute of Mining Engineers will hold its annual New York meeting Feb. 18 to 21, in the rooms of the society, 29 West 39th St. Secretary, Bradley Stoughton, New York.

American Society of Mechanical Engineers will hold its spring meeting June 4 to 7. Secretary, Calvin W. Rice, 29 West 39th Street.

Canadian Institute of Mining Engineers' annual meeting will be held Mar. 6 in Montreal, Canada. Secretary, H. M. Lamb, 503 Drummond Building, Montreal, Canada.

Economical Generation of Thermal Power at Coal Mines—III

By JOHN B. C. KERSHAW
9 Grosvenor Road, Colwyn Bay, North Wales

SYNOPSIS—*The type of boiler to be employed in a mine power plant should be decided upon after careful consideration. Both the internally fired and the water-tube types have their advantages. The adoption of hand-firing or the employment of mechanical stokers depends largely upon the skill of the available help.*

REFERRING again to the subject of the air mechanically retained in feed water, it may be pointed out that the presence of this impurity is sometimes due to the faulty packing of the feed-pump barrel. The best remedy for this evil is to repack the barrel, and if this fails, to raise the feed-water supply tank to a higher level and thus reduce the lift on the pump as much as possible. The delivery of the feed water inside the boiler should also be made within the steam space, and not below the water level, since in the latter case the mechanically held air will be diffused through the water contents of the boiler and will have time to effect considerable harm before its escape with the steam.

As regards chlorides, it is advisable not to use a water containing this impurity in any considerable amount; but if such use be unavoidable, it is well to clamp zinc plates inside the boiler shell at suitable points and to renew these as frequently as they are dissolved by the action of the chlorine upon them.

Boilers and Furnaces

In this section of my article I am not going to advocate the use of any particular boiler or furnace, but only to indicate the scientific basis upon which the choice of these for mining power plants ought to rest. The best types of boilers and furnaces for burning particular classes of coal will be indicated, but mine owners and engineers will be left to make their own selection among the various makers and manufacturers of the design recommended.

The fundamental requirements of a good boiler are that it shall produce a maximum quantity of dry steam with the consumption of a minimum amount of fuel, and that it shall also possess some reserve of steaming power. For coal-mining plants which intend to make use of good lump or well-graded small coal, the choice lies between the large shell type of boiler, such as the Lancashire, horizontal multitubular marine, and the large water-tube boiler.

The advantages of the former over the latter type are that its much larger water contents contain a big reserve of heat units, and that it can respond to a sudden demand for steam without much forcing or loss of pressure. It can also be used with a hard water supply, with less risk to the boiler than the water-tube type, since the cleaning of plates from scale is more easily carried out than the cleaning of partially stopped-up tubes.

The disadvantages of the Lancashire shell type of boiler are its water-cooled furnace, which sometimes leads to incomplete combustion and smoke production with highly bituminous fuels, and its poor circulation, which leads to a low steam-raising capacity for the volume of water contained. The former disadvantage can be overcome by the use of a preheated air supply and artificial draft, while the latter defect can be remedied by any of the well known devices for displacing the water from those pockets and corners where no movement occurs naturally. With these improvements in its methods of working, the Lancashire type of boiler is one of the most reliable for colliery work, with ordinary well-screened slack or coal testing up to 12.5 to 15 per cent. ash. In the United Kingdom it is the one most generally employed for coal-mining power plants.

It is quite a mistake to suppose that bituminous fuel testing up to 35 per cent. volatile matter cannot be burned in these boilers without excessive smoke production, for with proper regulation of the air supply and some arrangement for admitting secondary preheated air at the bridge or through the furnace door, during the period of maximum evolution of the hydrocarbon gases, high efficiencies and smokeless combustion are possible. There are many of these air-regulating devices on the market, and Fig. 1 shows one that has been operated with success in the Manchester district of Lancashire.

The Lancashire shell type of boiler, however, is not adapted for burning low-grade fuels with high ash contents, since these demand some form of brick-lined combustion chamber and mechanical ash-handling equipment for their satisfactory combustion. The comparatively restricted furnace and ash space of the Lancashire boiler is inadequate for these additions. When low-grade fuels, either in the dust or lump form, are to be burned, therefore, the large water-tube boiler must be adopted.

In large plants where the power demand is considerable and a battery of 10 to 20 boilers is required it is the wisest course to install boilers of each type, so that the plant, regarded as a whole, may possess the special advantages of each. The battery of Lancashire boilers would thus be fired with the better classes of fuel, either by hand or by mechanically operated stokers, and would be relied upon to provide the main steam supply and to take any bad feed water that came along. The water-tube boilers, on the other hand, would be operated with mechanical stokers and the poorer classes of fuel, and would provide steam for the periods of exceptional activity.

In very large plants a Bettington vertical tubular boiler might also be included, in order to make use of the fine coal dust which collects on the floors and ledges of the mines. This would only require drying in order

to yield a fuel of high calorific value, and its removal from underground would increase the safety of the operation. The dust from a large number of mines would be required, however, to keep one of these boilers in constant operation, and its installation is only suggested where the conditions warrant the expenditure.

As regards the method of gasifying poor fuels, described in Article I of this series, either type of boiler can be adapted for gas firing, but the form of burner employed must be different in the two cases. A long conical luminous flame is required in the Lancashire type of boiler and a spreading nonluminous diffused flame in the water-tube boiler. The difference is due to the fact that in the former case the greater portion of the heat which is transferred to the water passes through the plates of the boiler chiefly by direct radiation from the flame itself, while in the latter case the brickwork is the chief source of radiated heat. With suitable burners and baffling arrangements, however, high efficiencies up to 70 per cent. and over are attainable with gas heating, and if the Boncourt system of flameless combustion be used, still higher efficiencies are possible.

The Design and Setting of Boilers

The general conditions which must be observed in the design and setting of either type of boiler, if high efficiencies are to be obtained, are the following:

a. The furnace grate and combustion chamber of the boiler must be adapted to the physical and chemical characteristics of the fuel to be burned, and the heated gases should not be allowed to come into contact with the water-cooled plates or tubes, before perfect combustion has been attained.

b. The plates or tubes which are in contact with the water on the one side and with the hot gases on the other should be of ample superficial area to raise the steam required under normal conditions from each boiler without undue forcing of the fires, and the internal design should be such that the discovery of any corrosion or cracks may be made easy during the periodic inspections.

c. All portions of the heating surfaces exposed to radiation or contact with the hot flame and gases should be constantly covered with water, and the accumulation of scale on these surfaces should never be allowed to exceed $\frac{1}{8}$ in. in thickness.

d. The circulation of the water in boilers of the internally-fired Lancashire type should be promoted by some mechanical means at the dead points, notably underneath the ash boxes.

e. The side and end flues of the boiler should be provided with mechanical scrapers in order that flue dust may be regularly removed without interfering with the work of the boiler. Poor draft, especially when burning low-grade fuels, is often caused by the blocking of the flues with dust which ought never have been allowed to accumulate. The poorer the fuel the more frequent should be the cleaning of the flues.

f. In water-tube boilers the arrangement and number of the baffles have great effect upon the efficiency, and it is a mistake to assume that one fixed arrangement of the baffles is the best for all classes of fuel. The experiments of Henry Kreisinger and W. T. Ray upon "The Adaptation of Boiler Furnaces to Available Fuels" prove that there is great scope for improvement in this direction in the majority of existing water-tube boilers. This paper appeared in the *Journal of the Western Society of Engineers* for November, 1913.

g. The outer brickwork of the boiler setting should be air-tight, since the infiltration of air into the flues through faulty bricks and cracked joints not only spoils the draft, but leads to large heat losses. It is well to build the outside walls with a 3-in. air space inclosed between the two thicknesses of brickwork, and to paint

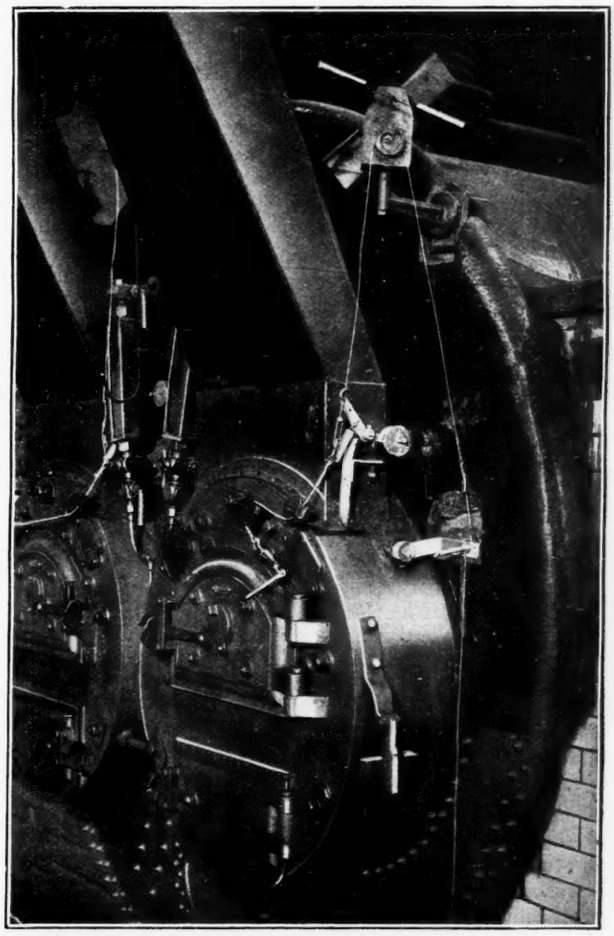


FIG. 1. MILLS AUTOMATIC ARRANGEMENT
For controlling primary and secondary air supply to a Lancashire boiler 8 x 30 ft., fitted with forced draft

or tar the outer wall at frequent intervals, in order to close all cracks and joints. In some cases sheets of asbestos or iron plate have been built into the wall for the purpose of rendering the brickwork air-tight. The boilers at the new Ashley St. Station, New York, described in *Power* for Oct. 9, 1917, are an example of good construction in this respect.

h. The exposed portions of the boiler shell and main steam pipes should be covered with a thick layer of some good heat-insulating material, in order to reduce convection and radiation losses. The spongy substance obtained by blowing air through slag as it solidifies, and known as "silicated cotton" or "slag wool," is one of the best materials for this purpose. I have been on the top of a battery of 8 x 30-ft. Lancashire boilers covered with this material, where it was cool enough to spend an hour without any discomfort from excessive heat.

The heat lost by radiation from uncovered boilers, especially when they are unprotected from atmospheric influences, is far greater than is suspected.

The diagram, Fig. 2, shows that under normal good conditions over one-fourth, or 27 per cent., of the heat of the fuel consumed in boiler furnaces is lost either by radiation or with the waste gases. It is wise, therefore, to take all possible precautions when installing boilers to reduce these two items of loss to a minimum. The fuel saved by even a 5 per cent. reduction of these losses would speedily pay for the better material or skill put into this work.

The methods of checking and controlling the work of the boilers will be dealt with in the last article of this series, when the losses in the waste gases will be more closely examined.

The three essentials required for good combustion and high efficiency in the burning of fuel are: (a) A sufficiency but not a great excess of air; (b) a thorough admixture of this air with the volatile hydrocarbon gases produced when the fuel is heated; (c) a temperature sufficiently high to cause the ignition and complete combustion of this hydrocarbon gas and air mixture.

The poor evaporative results obtained in many steam-boiler plants are due to the utter failure to maintain

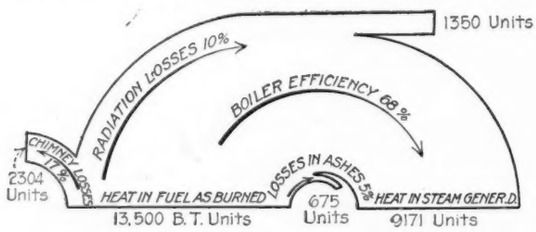


FIG. 2. DIAGRAM SHOWING HEAT LOST BY RADIATION OR WITH THE WASTE GASES

one or more of these three conditions of good combustion, and this failure is quite as often due to faulty design of the furnace and combustion chamber of the boiler as to want of skill on the part of the fireman.

Thus condition (a) demands mechanism or apparatus for controlling and regulating the air supply, condition (b) requires means for mixing the air and volatile hydrocarbons, and (c) necessitates the provision of combustion chambers in which the burning of the hydrocarbon gases can be completed before they come into contact with the water-cooled surfaces of the boiler. No fireman, however skilled, can obtain good results from boilers which are not provided with these requirements.

Considering, first, hand-fired furnaces, these as usually planned and operated fail as regards conditions (a) and (b), for it is evident that the opening of the furnace door for charging fresh fuel, or for cleaning the fires, must allow large volumes of cold air to pass through the furnace, thus abstracting much heat from the fires and plates of the boiler, with no useful result. No hand-fired boiler ought therefore to be started up without an automatic connection between the furnace doors and the dampers, so that when the firing door is opened the appropriate damper is closed (or nearly closed) and the draft through that particular furnace is cut off or considerably checked. The system known as the "balanced draft" system of working boilers attains this end by other means.

Such an arrangement is simple to install and easily maintained in working order, yet one seldom finds hand-fired boilers provided with it.

Again, in hand-fired furnaces there ought to be means provided for varying the air supply at different stages of the combustion process, for a furnace which has just received a charge of solid fuel and is filled with hydrocarbon gases demands more air than one which contains only glowing coke and cinders. The automatic arrangement shown in Fig. 1 is designed to meet this need. As already stated, other forms of regulating devices have been brought out, but are seldom used; yet no hand-fired boiler ought to be allowed to work without one or another of these attachments.

The best types of furnace for hand-fired boilers are provided with closed ash pits; with the mechanical or automatic devices described above for regulating the air-supply; and with means for providing a controlled supply of preheated air at the bridge or end wall of the furnace, for use during the periods of maximum evolution of hydrocarbon gases. The length of each furnace should not exceed 6 ft., or its width 3 ft., since this is the limit of size which one man can cover with fuel by aid of a shovel, in a reasonable time.

Air Leakage Should Be Guarded Against

The corners of the grate on each side of the door should be fitted with nearly straight firebars, giving very slight air apertures between them, since it is in these corners that much air leakage into the furnace may ordinarily occur, with bad effects upon the efficiency. The superficial grate area and depth of fuel bed must be adapted to the fuel burned. It is a mistake to assume that the conditions which suit one fuel are also the best for another of different composition and physical structure. The rate of combustion and depth of fuel bed which will give the best results under given conditions of draft can only be ascertained by actual trial. The average figures of 15 lb. of fuel per square foot of grate area per hour, with a fuel bed 8 in. thick and a draft equal to ½ in. water gage behind the fire, may be widely departed from in practice.

In small power plants any hand-fired boiler equipped as described above and placed under the charge of a well-trained man can show quite as high efficiencies as any type of mechanically operated furnace. It is only where larger boiler installations are concerned, or when low-grade fuels are to be burned, with the production of large amounts of clinker and ash, that mechanical stokers show any economic or other advantage.

Considering now the maintenance of the three essentials of good combustion in mechanically operated boiler furnaces, it is evident that with a regular and constant fuel feed and no opening of the furnace doors for firing or cleaning purposes, the regulation and control of the air supply becomes much simplified. The maintenance of condition (a) of good combustion is therefore provided for in all the best-known types of mechanical stoker, but conditions (b) and (c) are not always observed, especially when burning fuels which evolve large amounts of combustible gases.

Brick-lined combustion chambers which store up heat and assist by radiation in maintaining a high temperature in the furnace are particularly useful in such cases. A large amount of heat is absorbed when these

gases are being evolved from the freshly charged fuel, and unless this can be supplied from the furnace walls the fires are damped down every time fresh fuel is spread over them.

On account of the restricted size of the furnaces and flues the provision of refractory lined combustion chambers is not possible in the Lancashire type of boiler. In this respect it is at a disadvantage when compared with the water-tube and other boilers possessing an independent furnace and grate. In many instances, however, the combustion chamber of these boilers, as originally planned and erected, could be enlarged with advantage, and the raising of the boiler shells and tubes on their supporting framework 18 to 24 in. has often led to a considerable increase in the efficiency of the boiler.

As regards the methods for attaining a thorough admixture of the air and volatile hydrocarbon gases, mechanically operated stoking appliances and steam jets, hot-air jets and "baffling" are the devices employed.

The use of steam jets is the most popular, but unless carefully controlled these jets consume much more steam than is suspected and lead to considerable losses of heat in the chimney gases. Steam consumptions of from 4 to 8 per cent. of the total steam generated are quite common with these aids to more perfect combustion. The steam also has an erosive action on the jets, so that these are continually passing more steam than they were designed for.

A small pump to provide hot air and arrangements for forcing this air under pressure into the combustion chamber at selected points, in order to produce whirling and eddying effects upon the burning gases, is the better method of aiding the chemical changes in the combustion chamber. If this plan be combined with the skillful use of "baffles," the efficiency of the furnace will be raised to its maximum point. As already stated, striking effects can be obtained in some cases by altering the number and arrangement of the baffles in water-tube boilers.

The best method of baffling, however, can only be found by actual trials with the selected fuel; and no one arrangement of the baffles will suit all classes of fuel.

Finally, it may be pointed out with respect to mechanically operated furnaces that it is a mistake to assume, as is often done, that when once the best rate of fuel feed and speed of travel of the fuel along the grate has been determined for any particular grade of fuel the boiler can be left in charge of common laborers or unskilled men. The lesson taught by experience is that mechanical stokers demand skilled supervision and management if they are to yield their highest results. The economic gain resulting from their use lies chiefly in the fact that one skilled operator can attend to double or treble the number of boilers he could attend to if these were hand-fired.

The labor costs are therefore considerably reduced, but this saving is often balanced by the interest charges on the capital represented by, and upkeep charges upon, the mechanical portions of the plant.

In those places and mining districts, therefore, where there are plenty of intelligent men available who can be trained to make good firemen, it is perhaps unwise to install mechanical stokers, unless the other circumstances of the case render their adoption unavoidable.

(To be concluded)

Minecdotes

In Which Mine Bookkeepers Find an Unexpected Ally

"If you would really like to be of some use in the world, instead of merely occupying space," the mine boss said to the master mechanic in one of their numerous arguments, "you might invent an automatic mine bookkeeper and thus relieve the coal industry of one of its necessary nuisances."

"He wouldn't let me overdraw, either," replied the master mechanic.

"You're off on the wrong foot as usual," answered the mine boss, with a flush however that indicated the insinuation was perhaps, not altogether, amiss. "What gets my goat is the way a bookkeeper can take a deadwork report, a few cars of coal and some material orders, and jumble them up so it would take a man a week and two adding machines to figure out whether he ought to buy bonds or strike somebody for a loan."

"Did you ever keep books at a mine?" asked the master mechanic.

"No, I never did," replied the mine boss disgustedly.

"Well, if you ever tried it you would change your tune. The reason why I know is that one time, when the bookkeeper at old No. 12 got sick, I had to fill in; and believe me, I'll take mine in the shop. I would start in the morning posting the ledger, and would no sooner get my pencil sharpened than the 'phone would ring. I'd answer that. Then the boss would want to know the price of spikes somewhere back in 1887, and I'd look that up. The material clerk would butt in and want the waybill reference on a car of props that was lost between here and California. I'd dig that up. By the time I had done a hundred-or-so chores for every idiot who took a notion to come in, I had spent most of the time hunting for my place after the last interruption. I'd get through after awhile, somehow, and then take off my balance; and about the time I'd get halfway down a long column of figures some sucker would breeze in and say, 'Well, ol' timer, how do you like it as far as you've gone?'

"Then, in the afternoon, all the loafers in camp would come in to get store orders and argue about their accounts. Some gink would say he wanted an order and had $26.43 coming to him. His balance would show $26.13. I'd check his account back with him, and show him his error, after which he would shrug his shoulders as much as to say that he knew you were beating him out of 30c., but that he was too much of a gentleman to accuse you of it. I'd then start to give him the $26.13, when he'd say he only wanted 75c. anyhow. Finally, after I'd got worked up to where I'd determined to lick the next fellow who said beans, the whistle would blow, and I'd knock off to do the very same thing all over again the next day. No, sir; a mine bookkeeper earns all he ever gets and generally a whole lot more. There's only one thing about the job that has any advantage in it. After the bookkeeper got well and I went back to the shop, my wife told me that it was the first time I'd had my hands really clean in seven years!"

A Stripping Retrospect

IN THE early seventies, a superintendent of two collieries in the Hazleton anthracite region of Pennsylvania, learning of an interesting experiment in the Wyoming field, visited the operation to obtain further information in regard to it. At that time it was a decided innovation to remove the cover from a coal seam and mine the coal in the open. In a very primitive and limited way this was being done on the outcrop of a coal seam "somewhere in the Northern anthracite field."

This superintendent made a favorable report to his people, and as a result stripping operations shortly afterward were commenced at Milnesville, on the lease of the Stout Coal Co., a few miles north of Hazleton.

OLD NO. 6 COLLIERY OF A. PARDEE & CO., HAZLETON, PENN.

Quite a large area of flat Mammoth coal, with only about 10 to 20 ft. of cover, eventually was mined in the open. The stripping attracted considerable attention and various were the comments in regard to it—some even holding it up to ridicule.

In the light of present-day practice, when this method of mining contributes such a large tonnage in most of the coal states, it seems hardly credible or creditable that it should have had such adverse criticism in its early days. However, its advantages soon were so evident that other Lehigh operators began to strip coal, and the unsightly dirt banks and excavations, so characteristic of this region, began to disfigure the landscape.

Shortly after stripping was under way at Milnesville, a colliery was opened up at Hollywood, an adjoining lease. Here considerable work of this kind was carried on as the Mammoth seam "spooned out" on this property and lent itself especially to this method of mining. H. M. Chance covers the Hollywood strippings at length in Vol. AC of the Pennsylvania Second Geological Survey.

The Middle anthracite coal field of Pennsylvania, including Hazleton and adjacent territory, is characterized by a number of comparatively small local basins quite in contrast with the large, deep coal deposits of the Lackawanna and Pottsville regions. In the Middle field the Mammoth seam, or "Big Vein," as it is known to the trade, reaches its greatest development, attaining a thickness of from 30 and 40 ft. up to 50 ft. and over in special cases. In most of the other anthracite fields of Pennsylvania, the Mammoth seam is split up into several distinct beds, to be mined as such.

It was natural in the early days of stripping coal, that operations should be much more limited than at present. In the days of competitive rate-cutting by the individual operators, coal sold occasionally for about cost of production. In those days it was considered good practice to remove a yard of dirt provided a yard of coal was thereby recovered. At some of the extensive present day anthracite strippings, 8 yd. of material is removed to obtain one yard of coal; and the material overlying the "pay coal" may consist of dirt, loose rock and solid rock.

It would be interesting to compare the relative cost per yard of stripping at the different periods, but exact figures are probably not readily obtainable. The first work of this kind was done by company men, but soon contractors undertook it on much the same basis as rail-

road excavation of a similar nature. Doubtless this comparison would throw some light on the subject. At several collieries at which the writer took up the stripping estimate each month, the prices were—dirt, 19c.; loose rock, 35c., and solid rock, 50c. per yard. The time referred to was about 1890.

The photograph from which the accompanying illustration was made was taken about this same time. It is interesting not only from a stripping point of view, but it also illustrates a typical Lehigh coal basin. The Mammoth seam stands out in bold relief in the center of the picture; the outcrop on the left can be traced almost to the slope of the breaker on the horizon; on the right the coal rises somewhat to an anticlinal and then pitches heavily, forming the north dip of the main Hazleton basin. The illustration shows the old No. 6 colliery of A. Pardee & Company.

In further explanation of this illustration it may be said that most of the "spoon" coal of this basin has been stripped and the coal sent to No. 6 breaker for preparation. Following closely on the foregoing operations is further work of a similar nature, the dirt bank of which is seen in the foreground at the left.

Thorough prospecting by a churn drill, operated by two or three men, frequently located large bodies of coal which were profitably stripped. This was especially true of the ends of basins and along the side crops, where the coal often folded over, flattened out and would likely have been lost by ordinary methods of mining.

It is a rather singular coincidence that while stripping in the Lehigh field started at the colliery of the Stout Coal Co., on the other hand probably the most extensive work of the kind in recent years is at the operation of the old Ebervale Coal Co. In the seventies these two collieries were under the same management and associated in the sense that the Stout interests were prominent stockholders in the Ebervale company. The latter property is now controlled by the Markle brothers, whose extensive strippings at this place are described in the Sept. 25, 1915, issue of *Coal Age*.

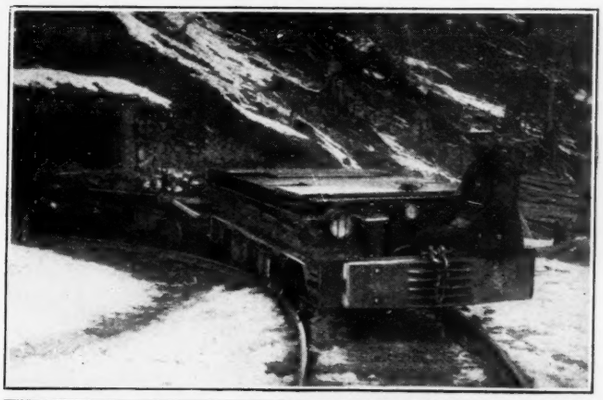
Legal Department

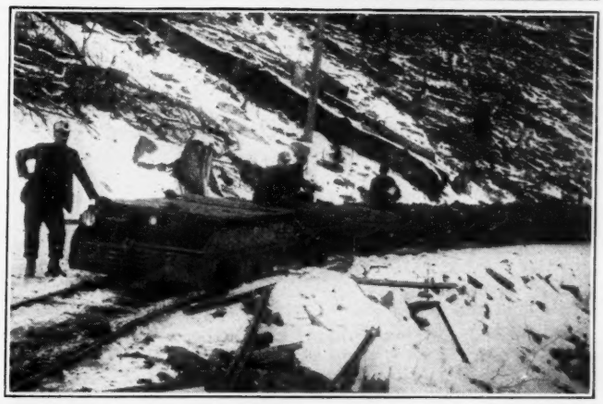
RESPONSIBILITY FOR HOISTING ENGINEER — An engineer employed at a mine to operate a cage in a shaft used in hoisting and lowering miners is to be regarded as a representative of the mine operator, and not a fellow servant of the miners in such sense as to absolve the mine owner from liability for injury sustained by a miner through such engineer's negligent operation of the hoist. It was manifestly negligent for the operator of an electric hoist to release it without using the brake or clutch, whereby the cage was dropped suddenly 110 ft., resulting in serious injury to plaintiff while riding on the cage for the purpose of going from a 500-ft. level to the 600-ft. level in defendant's mine, and the injured man is entitled to recover damages. (Utah Supreme Court, Farnon vs. Silver King Coalition Mines Co., 167 Pacific Reporter, 675.)

RISK ASSUMED BY COAL-CUTTING MACHINE OPERATOR—The operator of a coal cutting machine is not entitled to recover damages on account of injury sustained through the rear jack falling upon him while he was at work, where he knew as well as, or better than, any one else the defective condition of the machine and fully appreciated the danger to which he was exposed, voluntarily remaining at work for three months under such conditions, without any assurance from his superiors that the machine would be put in safe condition, although he had repeatedly taken the machine to the shop for repairs. (Kentucky Court of Appeals, Stonega Coke and Coal Co. vs. Bush, 197 Southwestern Reporter, 389.)

PUBLIC COAL LANDS—The fact that one was disqualified to hold title to public coal lands did not invalidate a title acquired by him from one who was so qualified and transferred to another who could lawfully receive it. And the fact that one has conveyed title to coal lands which have not yet been granted to him by the Government does not affect the validity of the conveyance, if he afterward obtains such grant, which will inure to the benefit of his grantee. (Utah Supreme Court, Ketchum Coal Co. vs. Pleasant Valley Coal Co., 168 Pacific Reporter, 86.)

RIGHT TO COMPEL CONVEYANCE UNDER CONTRACT—Although the courts will not compel specific performance of a contract to convey land where it appears that any degree of fraud has been practiced by the party who seeks performance, representations made to induce the owner of the surface of coal lands to convey his rights to the corporation which owned the coal, in exchange for stock in the company, concerning the profits which the company would probably earn, cannot be deemed to be such representations as to form the basis of fraud, they being mere matters of opinion. The stock issued to the grantor being worth about $3500, and the surface rights having been virtually valueless except for mining purposes, it cannot be said that the consideration for the conveyance is so inadequate as to deprive the corporation of the equitable right to a specific performance of the contract. (Kentucky Court of Appeals, Bartley vs. Big Branch Coal Co., 169 Southwestern Reporter, 601.)





IRONTON STORAGE BATTERY LOCOMOTIVE OWNED BY RAVEN COLLIERIES CO., RED ASH, VA.

Above—Locomotive coming out of company's No. 3 mine. Below—Same locomotive with a trip of loaded coal cars from No. 3 mine

Who's Who In Coal Mining

J. D. A. Morrow

BY THE application of horse sense and sound business methods, J. D. A. Morrow expects to get tangible results in the matter of coal distribution. Mr. Morrow has been designated by the Fuel Administration as manager of apportionment and distribution. Since all have agreed that distribution is the big problem to solve in the coal situation, Mr. Morrow has been thrust into a position hardly less important than that occupied by Dr. Garfield.

Mr. Morrow was associated intimately with Edward N. Hurley, now the chairman of the United States Shipping Board, when he was a member of the Federal Trade Commission. Mr. Hurley's ability to apply business methods to Government activities so impressed Mr. Morrow that he is thoroughly imbued with the same policy. He expects to work as if he were the general sales manager of a private company, and he expects to get private-company efficiency out of his organization.

J. D. A. MORROW

Practical coal man who has charge of apportionment and distribution of coal for the Federal Fuel Administration

It was Mr. Morrow who started the Federal Trade Commission's bituminous coal investigation. In justice to Mr. Morrow, however, it must be stated that he simply initiated the work and is in no way responsible for the general pooling recommendation and the other suggestions made by the Federal Trade Commission in connection with that investigation.

Mr. Morrow was importantly connected with the investigation made by the Federal Trade Commission which led to its recommendation to Congress that American firms be allowed to coöperate in the conduct of foreign trade. This report resulted in the Webb bill.

Just at this time Mr. Morrow's whole attention is concentrated on preliminary arrangements for a drive for more efficient transportation conditions as they apply to the furnishing of cars to the mines. It is his hope to be able to build up an organization of coal distribution which soon will compare favorably with that of England and with that of Germany. Mr. Morrow is a graduate of Ohio Weslyan. He was born at Campbellstown, Ohio.

The Fuel Administration's announcement of Mr. Morrow's appointment reads as follows: "The United States Fuel Administration announces the appointment of J. D. A. Morrow to be manager of apportionment and distribution. This appointment is in accordance with the general plan of centralizing the authority and lines of report at headquarters. It is intended also to facilitate the introduction of the new plan of partial decentralization of apportionment and distribution without overburdening the present organization.

"Mr. Morrow will have general charge of the apportionment and distribution from producer to consumer of all fuel except petroleum. He will supervise all budgeting and statistical work, as well as pools and other transportation matters. He and the bureaus reporting to him will have no connection with the fixing of operators' base prices or retail prices, nor will he have authority or supervision over state administrators on matters other than apportionment and distribution.

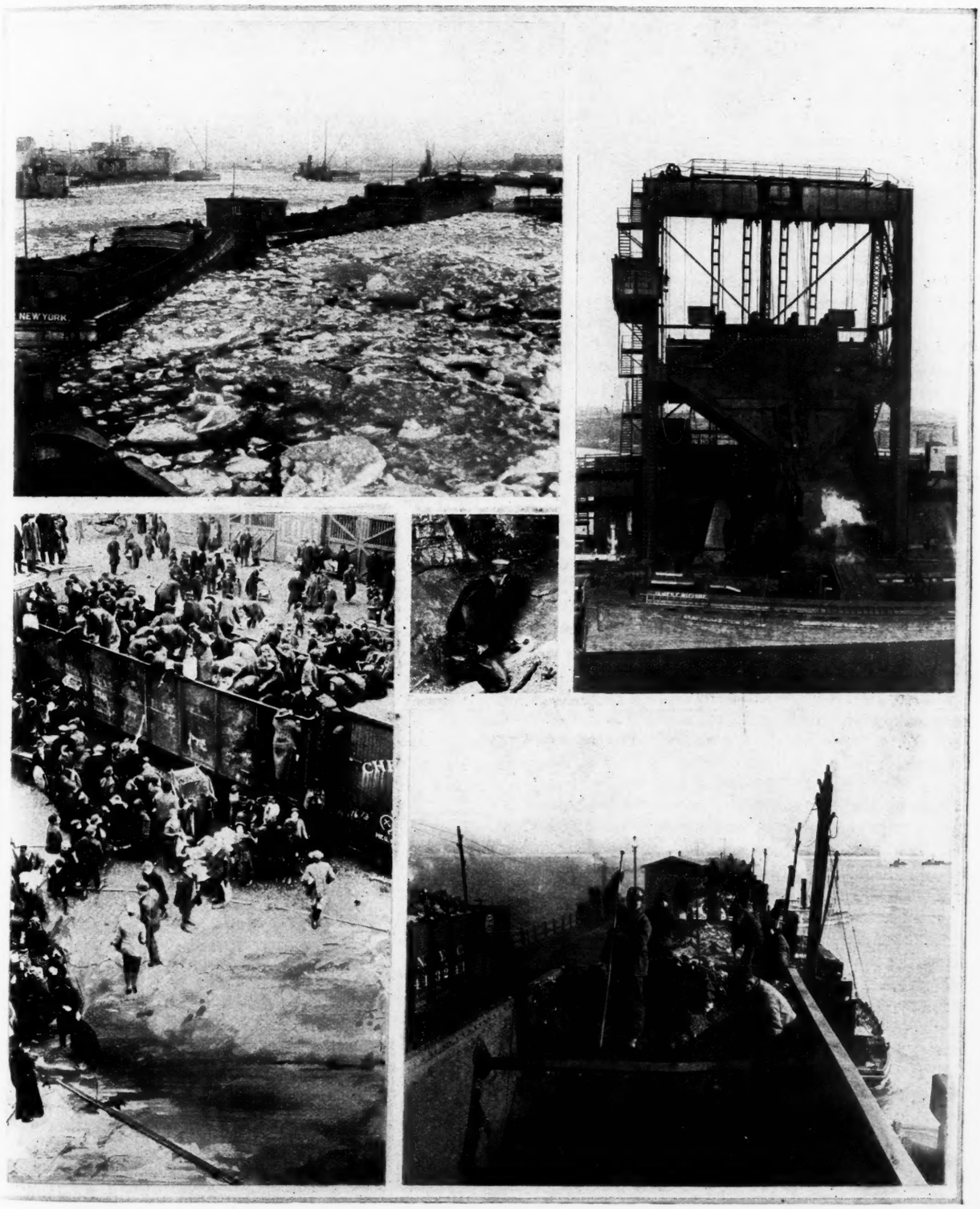
"Mr. Morrow has been assistant secretary of the Federal Trade Commission, commissioner of the Pittsburgh Coal Producers Association and recently general secretary of the National Coal Association, representing the bituminous coal operators of the country."

Women Learn First Aid on Bureau of Mines Rescue Cars

With the wives of miners and other women members of mining committees as pupils, the United States Bureau of Mines has entered upon an active campaign to reduce casualties. Eight "mine-rescue cars," each with a crew of men highly trained in modern rescue methods, have been equipped and are making the rounds of the mining communities. Five hundred women have taken the course given and the bureau has been overwhelmed, since the declaration of war, with applications from women who wish to replace men on the cars.

Casualties in American mining have been large and the fatalities have been figured by the bureau at 3.30 for every thousand men engaged. According to reports from mine operators during the months in which the first-aid courses have been conducted, the loss of time from accidents has been materially reduced. The results of the campaign are also noticeable in the better school attendance of miners' children.

Before Coal Gets to the Ultimate Consumer



The photographs on this page illustrate some of the things that happen to coal before it reaches the ultimate consumer. In the upper left is shown a string of barges plowing its way through the ice of New York Harbor during the recent cold spell; it was the first time in many years that the harbor had been practically frozen over, and this was one of the hindrances that intensified the coal shortage in New York City. In the lower left is shown a not unusual scene in railroad yards where cars loaded with coal were unable to be moved on account of congested transportation facilities. Many people, driven to desperation by the cold, came with carts, wagons and bags to carry the coal away. The view in the upper right is of one of the great modern coal dumps in use at large coal-distributing centers. The dump illustrated can turn over a car loaded with coal, emptying it at one stroke. This modern invention saves a great deal of labor and makes for great efficiency in the unloading of coal. In the lower right is a general view of a crew of men on top of some coal cars trying to loosen frozen coal by the aid of crowbars. The coal is frozen in huge lumps to the sides of the cars. Conditions such as these make it hard to speed up the movement of fuel to the places where it is most needed.

[Men of the coal industry who find it necessary to get to the national capital on business these days are invited to avail themselves of the facilities afforded by the Washington Bureau of "Coal Age," which is centrally located in the Union Trust Building. The bureau is in charge of Paul Wooton, who is in a position to be of material assistance to those who have business to transact with Government officials. Have your mail addressed care of "Coal Age," Room 307, Union Trust Building, Washington, D. C., while at the capital.—Editor.]

Weekly Production Statistics

Bituminous coal production was 10,018,000 tons, beehive coke production was 491,000 tons, and anthracite forwardings were 33,406 cars for the week ended Jan. 26, according to an estimate based on the returns from a high percentage of production made to the United States Geological Survey.

The coal production for the week, which averaged 1,670,000 tons per working day, still is much below normal and under the rate of production for the corresponding week of the year previous, but shows a decided improvement over production for the week preceding, when it was 8,566,000 tons.

Beehive coke production fell to the lowest point since June. The average per working day was 82,000 tons. During the week preceding, the average per working day was 88,000 tons, while during the week of Jan. 12 it was 94,000 tons.

Anthracite shipments, while somewhat greater than those during the week of Jan. 19, are still considerably below the normal forwardings.

Byproduct coke also reflects the depression in the coal industry, but not to the same extent as does beehive. Production during the week ended Jan. 19 was 319,524 tons. This is 65.9 per cent. of full-time capacity. Inability to secure coal, owing to transportation difficulties, is charged with 23.7 per cent. of the loss. This does not apply to Minnesota, where ample coal supply allowed continuous operation. In addition to cutting down the available coke so badly needed at steel mills, the reduction of output at byproduct plants decreases the badly needed supplies of ammonia, benzol and toluol.

Unfilled car orders at mines was the principal cause for the ratio of tonnage produced to full-time capacity. During that week, production fell to 55.8 per cent. of full-time capacity, or the lowest point reached since early in the year. The trouble to a considerable extent was the result of heavy snows. In Ohio, production fell to 40.3 per cent. of full-time capacity.

More District Representatives Appointed by Fuel Administrator

J. P. Cameron, of Altoona, Penn., has been designated as district representative of the Fuel Administrator for the coal fields of central Pennsylvania. With the announcement of Mr. Cameron's appointment, the names of the three assistant representatives who will work under him were made public.

John Lloyd, Jr., of Altoona, will be in immediate charge of coal produced at mines in Huntington and Bedford Counties; in that portion of Somerset County served by the Pennsylvania R.R., as well as the mines on the Pennsylvania between Crosson and Blairsville, and on the South Fork division and the Indiana branch.

Harry B. Scott, of Philipsburg, Penn., will be in direct charge of Center County, Cambria County (except that part coming under the jurisdiction of Mr. Lloyd), eastern part of Indiana County and all operations in Greenfield County tributary to the New York Central and Pennsylvania railroads.

Samuel A. Rinn, of Punxsutawney, will be in immediate charge of the producing district served by the Buffalo, Rochester & Pittsburgh R.R. in the western half of Indiana County; mines in Armstrong County served by the same railroad and by the Buffalo & Susquehanna R.R.; mines in Greenfield County tributary to the Buffalo, Rochester & Pittsburgh R.R.; mines in Jefferson, Elk, McKean, Cameron and Clinton Counties.

C. M. Roehrig, of Ashland, Ky., has been appointed district representative for the coal field comprised of the Counties of Boyd, Carter, Floyd, Johnson, Letcher and Pike (except the mines served by the Norfolk & Western Railway).

W. R. J. Zimmerman, of Charleston, W. Va., is district representative for the New River coal field in southern West Virginia, comprising operations on the Chesapeake & Ohio Ry. south and east of Hawks Nest, and all operations on the Virginian Railroad.

E. S. Howe, of Bluefield, W. Va., will be the district representative for the Tug River and Pocahontas coal fields in southern West Virginia and the Clinch Valley and Virginia anthracite fields in Virginia, comprising all operations on or tributary to the Norfolk & Western Ry. in West Virginia east of Panther, and embracing Mercer County and parts of McDowell and Wyoming Counties, West Virginia, and Tazewell, Montgomery, Pulaski and Russell (east of Coulwood on the N. & W.) Counties, Virginia.

Interstate Commerce Commission Allows Changes in Demurrage Rules

Changes in demurrage rules, regulations and charges, governing cars containing anthracite coal, bituminous coal or coke for transshipment by vessel, have been allowed, effective Feb. 10, by the Interstate Commerce Commission. The new regulations provide that:

Cars containing anthracite coal, bituminous coal or coke for transshipment direct by vessels, or to be stored for shipment by vessels when held for or by consignors or consignees for unloading, forwarding directions, or for any other purpose are subject to these rules except

a. Cars reconsigned or reshipped for rail delivery or to another rail destination will be subject to the National Car Demurrage Rules (Tariff I. C. C. No. ———) from arrival. An average of three (3) days per car free time will be allowed.

A. A notice of arrival must be sent or given to the consignee in writing or as otherwise agreed to by carrier and consignee upon arrival of cars and billing at ———— (destination yard) ————.

Time will be computed from the first 7 a.m. after the day on which notice of arrival is sent or given to the consignee.

Note—In computing time Sundays and legal holidays (national, state and municipal), but not half-holidays, will be excluded. When a legal holiday falls on Sunday, the following Monday will be excluded.

B. A car shall be considered as released:

1. At the time vessel registers for the cargo or fuel supply of which the coal or coke dumped into such vessel is a part, except that when cars are unloaded before the vessel registers such cars shall be released when unloaded.

2. The date shipments are transferred by written order and acceptance to another party shall be considered the date of release of the car for the account of the original consignee and the detention shall follow the car and be charged in the account of the new consignee.

3. Any fraction of a day will be computed as one day.

Settlement shall be made on basis of the detention to all cars released during each month. The date of arrival notice shall be subtracted from the date of release. From the total days detention to all cars thus obtained deduct three days' free time allowance for each car; the remainder, if any, will be the number of days to be charged at the rate of $3 per car per day. Excess credit days of any month can not be deducted from excess debit days of another month.

Exceptions at Lake Ports: (1) Cars released during April and May shall be considered as May detention and treated as one month. (2) The season of navigation shall be considered as extending from April to December. Loaded cars on hand at the close of navigation will be recorded released on that date in computing the average detention and subsequent detention will be subject to the National Car Demurrage Rules, as per Tariff I. C. C. No. ———.

Bureau of Internal Revenue To Issue Income Tax Regulations

Regulations governing the administration of the income-tax law are about to be issued by the Bureau of Internal Revenue. The rulings relating to depletion in mining properties and to dividend payments from depreciation and depletion reserves are among the more important. With regard to mining corporations, it is stated that in passing on values, as of Mar. 1, 1913, as a basis for depletion, the Commissioner of Internal Revenue will give due weight to market quotations of capital stock as of that date and to values stated by the corporations in their capital stock returns. It is held that dividends paid of depletion or depreciation reserves are in the nature of a liquidation dividend and are a return of capital to the stockholder and not taxable as income. Such dividends will not be so regarded, however, unless the income and surplus first have been distributed and the fact that their capital has been reduced or partly returned is made public in their published statements.

A ruling has been provided for computing the amount necessary to return capital invested in oil and gas wells. The rule is based upon estimate of the units contained in the property, and fee owners and lessees are placed upon the same basis in so far as bonuses actually have been paid for leases.

State Fuel Administrators Must Conform to Washington Regulations

Some confusion is resulting, due to the inequalities in the administration of various restrictive regulations issued by the Fuel Administration. To prevent this, state fuel administrators have been instructed to conform to the regulations as promulgated in Washington. This, it is believed, will prevent the inequalities in the requirements of different communities. Some latitude is left to state administrators to cope with local conditions, but it is expected that most of the additional regulations, which have been issued by the state administrators, will be revoked. In some cases these additional regulations have resulted in inconvenience to the public, which is said to be out of all proportion to the saving of fuel effected.

"Most Expensive Coal Purchase in Country," Says Senator from Michigan

Only six tons of coal were saved at 37 furniture factories at Grand Rapids, Mich., on each of the fuelless Mondays, according to a statement made by Senator Smith, of Michigan, on the floor of the Senate. In part, he said:

I wish to say, if the chair will indulge me, that the most expensive coal purchase in the United States on any day was purchased in my home city of Grand Rapids, where six tons of coal cost over $22,000. The consumption capacity of the city of Grand Rapids, Mich., with 135,000 people, is 3000 tons of coal a day. Monday 37 of the leading furniture industries of that city, and the leading furniture center in the world, were closed down by order of the Fuel Administration to save six tons of coal that could be carried upon two wagons. It would have taken, by a very careful and painstaking review among our factories, six tons of coal more to have operated 37 factories in the city of Grand Rapids Monday than it took to close them down, and nearly 8000 workmen were put into the streets on that day, and their wages wasted by Government order. That is a high price to pay for coal in the United States; a tremendous sacrifice for labor to make in order to humor a caprice, a mere caprice. If that is wisdom, I do not understand it. No, Mr. President, it is reckless indifference to individual liberty and the rights of citizenship.

I rise in my capacity as a Senator to protest against the sacrifice of labor and of business to the whims of a Fuel Administrator who will not see his error. Think of it, sir! Thirty-seven great furniture-manufacturing plants closed down a whole day to save six tons of coal! And in the nine idle days that are to follow, if this order stands, 54 tons of coal—scarcely a carload—will be saved and over $250,000 in wages to workmen lost.

At a conference between McAdoo and Garfield on Tuesday it was decided not to withdraw the order for workless Mondays for the present.

THE LABOR SITUATION

General Labor Review

The outstanding event of the last two weeks is the decision of the operators in Alabama to accept the provisions of the agreement written by Rembrandt Peale, the representative of the bituminous operators in Mr. Garfield's "cabinet." The mine workers signified their approval of it Dec. 21 of last year, and on Jan. 12 the Fuel Administration demanded that the operators signify their accession to its terms. The contract will be found in abstract on pages 152 and 153 of this volume.

The operators object to taking men into their employ who they say never worked for them and only joined the union to prey upon it and upon the mine operator. The operators say that they will not recognize the union. The contract accepted does not involve this recognition, but it establishes committees of workmen such as will almost inevitably be union organizations. Alabama is to all intents and purposes unionized. The wage question is regarded as of less importance by the operators. They say they will raise wages if they find it necessary to do so in order to maintain production.

Trouble with the Laflin "I Won't Works"

The strike of the mine workers of the Traders Coal Co., at Ridgewood near Laflin, Luzerne County, Pennsylvania, is approaching an end. On Jan. 30 half the men on strike went back to work. The mine has normally about 500 employees. As stated last week in the General Labor Review, over half these went on strike because the superintendent could not lower the men into the mine owing to the late arrival of the engineer. The mine workers demanded the discharge of the foreman, T. J. Conway.

Between Wilkes-Barre and Scranton on the southern edge of the northern anthracite field are some towns inhabited by "willful men." In these villages trouble seems chronic. Not even the war seems entirely able to make these men give up their striking propensity. The towns particularly affected have been Dupont, Laflin, Avoca, Moosic, Inkerman and Forty Fort.

Union Is Not To Blame for This Strike

At one time it was seriously proposed to arrest the ringleaders under a charge of helping the enemy, but when some of the men returned to work the intention was given up. Many of the men are Italians and Industrial Workers of the World. The strike cannot be charged to the United Mine Workers of America.

There have been several attempts to make trouble in central Pennsylvania. On Jan. 31 John Homick, of Winber, was arrested and a warrant was issued for Andy Janacz, also of Winber, the charge being that they endeavored to induce Austrians to quit work and naturalized Austrians to refuse to join the United States Army. Janacz is critically ill in the Winber Hospital and so has merely been put under surveillance.

Serbians and Turks Fight Battle To Death

Another evidence of the reaction of the war on industry was at Edna No. 1 of the United Coal Corporation. At this mine, which is near Adamsburg, Westmoreland County, Pennsylvania, two Serbians had, on Jan. 22, a fight with three Turks. One Turk was killed and the other two wounded. The Serbians escaped victorious.

The miners at a small mine (37 men only) at Denning, Ark., have written to Dr. H. A. Garfield complaining of the inadequate equipment of mine No. 2 of the McGraw Coal Co., at which they work. This company is a subsidiary of the Western Coal and Mining Co. The men say that at the Denning Coal Co.'s mine and that of the Douglas Coal Co. the output of each miner is nine tons, whereas at the two openings of the McGraw concern the tonnage is only five tons, though the coal is of the best.

The miners ask for more company men and more mine cars. There are only 13 for 37 men, and they have been in use, the men say, for 20 years. The men offer to work on Sunday, if necessary, to "do their bit." They are, they say, "as patriotic as" they "know how to be."

Though the mine is small, the protest is worth recording. The anxiety of the men to work, their impatience with inefficiency, their readiness to submit to every inconvenience to do their part in the work of supporting the nation shows that we do wrong when we generalize about the great Southwest. Apologies from the editor of this department may yet be in order. By the way, these are union men—Local Union No. 1814.

It is reported that the Nova Scotia Steel Co. succeeded in making a satisfactory settlement with the men at its Jubilee mine when representatives of the miners and the company met with R. W. Crothers, the representative of the Canadian government. The company will pay the miners a regular contract rate for each ton mined. The miners are not members of the United Mine Workers of America as are those in western Canada. Their union is known as the Amalgamated Mine Workers, Silby Barrett being president and J. D. MacLachlan, secretary-treasurer.

White "Passes the Buck" to Operators

Little stock is taken by John P. White, former president of the United Mine Workers, but now a member of the Fuel Administrator's staff, in the cry that has been raised against dirty coal. It is Mr. White's opinion that it shows poor judgment on the part of mine operators especially, to be making extravagant claims regarding the amount of noncombustible matter contained in coal being shipped under the President's prices, which make no provision for a higher price for coal that has passed through a washery.

Mr. White says that if any considerable increase has taken place in the amount of noncombustible matter being marketed it is the fault of the operator. In this connection he pointed to the resolution regarding the penalties for loading impurities, which is a part of practically every agreement entered into between mine operators and their employees. This resolution, which is substantially the same, in all fields, reads as follows:

(a). Both the miners and operators realizing the importance of getting clean coal, to insure the sale of same, it is mutually understood and agreed that the miners and loaders will produce their coal in such a manner as not to increase the percentage of fine coal either by carelessness or reckless shooting, and will load the coal free from impurities as nearly as possible.

(b). It is the duty of the miner and loaders to clean their coal in their working places and load it as nearly as possible free from slate, sulphur, and other impurities, and if any miner be docked for sending out dirty coal, he shall be notified by the mine foreman; if he be docked a second time, he shall be fined 50c.; if he be docked a third time within 15 days from the time of the first offense, or if he at any time sends out large quantities of impurities, in any one car, he shall be fined $1 or discharged at the option of the operator. But before discharge the pit committee and superintendent shall investigate such case, and if found guilty the discharge penalty may be enforced. It is understood local agreements shall govern the amount that constitutes a dock or large quantity at each mine. When there is no local agreement the local officers and superintendent of the company shall make such an agreement.

(c). It is hereby agreed that the local officers shall cooperate with the coal company to insure clean coal.

Mr. White is unwilling to believe that there is any foundation in fact for many claims that are being made that the equivalent of thousands of cars is being used monthly to transport the noncombustible matter loaded with the coal. If it is the case, he says that it means that the operators are not exercising their well-established right to insist on receiving a reasonably clean product from their mines.

Mr. White has just returned to Washington after the Indianapolis convention. He is very proud of the 19,135 stars in the United Mine Workers service flag. He is proud of the fact that nowhere in America is there a coal strike. He says the mine workers are ready to flood the country with coal if someone will arrange to furnish them with all the cars they can load.

Some Convention Decisions

The United Mine Workers at their biennial convention provided that no member of the Industrial Workers of the World should be allowed membership in the United Mine Workers of America. The resolution was as follows:

Any member accepting membership in the Industrial Workers of the World, the Working Class Union, or any other dual labor organization not affiliated with the American Federation of Labor shall be expelled from membership in the United Mine Workers of America, and no members of any such organization shall be permitted to have membership in our union unless they forfeit their membership in the dual organization immediately upon securing membership in the United Mine Workers of America.

They declared that they approved of the taking over of the coal mines by the Government so long as their right to the making of collective bargains was not impaired.

They asked no special privilege in the selective draft unless "it should be demonstrated that the members of our organization can render greater service to the country by remaining in the mines than they would be able to render by being drafted into the military service of the Government." The mine workers also passed an amendment permitting boy scouts to become members of the union.

The per capita tax was increased from 25c. to 50c. per month. The salary of the president of the union was made $5000 a year, the vice president is given $4125, the secretary-treasurer the same. The editor of *United Mine Workers' Journal* will receive $2500 a year, and international executive board members $175 a month when employed; tellers, auditors and the delegates to the American Federation of Labor will receive $7 per day when in service. All will receive in addition to their salaries all legitimate expenses when employed by the organization away from their places of residence.

Central Illinois Fills National Coal Bin

In contrast to the action of the Pana miners in causing a loss of two days' output for a trivial reason is that of the 375 miners employed at the mine of the Woodside Coal Co., at Springfield, in working on Sunday, for the first time in the history of the central Illinois coal industry. Without persuasion from the company officials or the fuel administration the men had a meeting on Saturday night and voted to make it seven straight by working the next day. They so notified President William B. Jess and were all on hand when the whistle blew Sunday morning. There were enough cars on hand and 1400 tons were hoisted. Besides filling the cars the Sunday workers supplied coal to teamsters, who also worked on Sunday making urgent deliveries.

Miners of St. Clair and Madison counties are considering Sunday work. In some cases operators have discussed it with union officials and asked them to take it up at their meetings. It is expected that action will be taken at the monthly meetings of the locals. The suggestion of the operators is that the miners agree to work on Sunday when cars are available and lay off some other day in the week when there is a scarcity of cars.

Two hundred and fifty miners employed by the Pana Coal Co. are the first in the central Illinois field to feel the weight of the automatic penalty clause. From each $4 was withheld on the last payday because they violated their agreement by refusing to work on two consecutive days. The men claimed that the wash house at mine No. 1 was cold and damp, and for that reason they refused to work. Officials of the company say that they warned the men that they would be fined but they persisted nevertheless. They grumbled when $3 was deducted for the first day and $1 for the second, but as their only recourse was another strike which would have brought more fines they finally submitted.

Coal teamsters of Springfield, Ill., have applied to Fuel Administrator Converse for permission to charge from 80c. to $1 a ton for delivering coal. Converse informed them that an inquiry into present costs and conditions would be made before he would give his decision.

Operators claim that miners are badly needed in central Illinois. The Central Illinois Coal Operators' Association has sent a letter to all the exemption boards in the six counties of the Springfield district, requesting that no more of their employees be taken into the army. The letter, which bears the signatures of President H. C. Adams and Secretary W. J. Walsh, says in part: "The mines of this district as a whole are now operating short-handed and could use advantageously 20 per cent. more skilled laborers than they now have, thus increasing the output of the much-needed coal in corresponding measure. Any further reduction in the number of skilled laborers available for coal mining will seriously reduce the output, not only by the loss of the individual tonnage of the men who leave, but also by cutting down the manpower of the mine below the point of most effective production for each man employed.

"In this situation we feel it is our duty to urge upon the exemption boards of this territory that the needs of the country demand that skilled workmen in mines, including diggers, drivers, clerks, engineers and bosses be in all cases given the deferred classification that has been provided for necessary skilled labor, such as these individuals can perform. In order to produce coal effectively it is absolutely necessary that all the classes of skilled labor engaged in mining shall be left in the mines." The letter states that there are 25 mines in the organization, producing 3,000,000 tons a year.

When the North Mine No. 2 at Pana, Ill., resumed work the other morning, $50,000 having been spent in overhauling it and in installing new equipment during the shutdown, only 50 miners reported for work, whereas 300 could have been accommodated.

Right of Aliens In Union Restricted

On Jan. 10 the Ohio district of the United Mine Workers in session at Columbus voted that "any unnaturalized miner in Ohio not a subject of a country at war with the United States will forfeit his membership in the United Mine Workers of America if he does not declare his intention to become an American citizen as soon as he has been here the required time to make the declaration." The Ohio men urged government ownership of railroads in a resolution.

Hist! The Bogie Man

Miners in the bituminous coal mines of the Newcastle Coal Co., near Newcastle, in Young County, Texas, have resumed operations after remaining out of the mines for several days because they declared that German spies and German sympathizers were planning to blow up the mines. Last Monday the miners poured from the mouths of the shafts declaring that a strange man carrying a light had been seen in the mine and that he ran and disappeared when followed. Guards were stationed at all the mine openings, and searching parties were sent into the tunnels to explore them and search for the strange person. The search that lasted several days and extended to the remotest parts of the mines failed to locate anything, and the miners were induced to return to work.

EDITORIALS

Quit Attacking the Coal Industry

THE railroad company officials sadly need efficient leaders for publicity purposes. The transportation companies have shown a large sense of their obligation to the public since the war began, and the public is beginning to realize that the failure of the railroads is the result of the public's persecution.

We, as a nation, are beginning to learn that we are being punished for the sins perpetrated against the transportation companies. They have not lacked locomotives, cars, sidetracks and what not without there being a reason. That reason has been lack of profit. The anthracite railroads, which have made profits, until the present cold spell supplied their subsidiary mines with the needed cars and had the locomotives to move them, even though the tonnage had increased heavily.

As the condition of the railroads is chargeable to the public, and as the railroads are now in the hands of the Government and need not fear therefore to acknowledge their utter failure under stress, why do they not admit it and demand generous consideration of their needs? Instead they attack the coal producers, declaring them avaricious, incapable and unpatriotic.

In their plight the railroads should not deliberately go out of their way to make enemies of those who have not injured them. They are very ready to be vocal against the coal men who have not hurt them and cannot help them, and silent about those who have injured them and who can, by better treatment, reëstablish them in their rights.

The railroad men need publicity, for not even the greatest of their wrongs has yet been righted. The Interstate Commerce Commission, which by its restraining action ruined the railroads of the country, still maintains its existence. That commission, and the public which has supported it with unanimity in the past, is to blame for the situation. With the evidences of its work so painfully manifest, why is it not done away?

It is said that it is retained to advise the National Railroad Administration. We would think that Railroad Director W. G. McAdoo would look for advice elsewhere. It seems entirely unnecessary to keep a commission—and such a commission—for that purpose. Let the public show its good will to the railroads by lifting this Old Man of the Sea from the shoulders of the transportation interests. The United States Federal Courts would still remain with us and would furnish a sufficient corrective and, when the war is over, if they would not serve the purpose, another commission with another name and no unfortunate precedents should take the place of the Interstate Commerce Commission. There are some good men on that commission. Those on that body whose clarity of vision foresaw the failure of the railroads and whose good judgment pleaded that a more generous treatment be given them, might well be appointed to the new organization with the approval, we hope, of every reasonable man.

But, meanwhile, let the railroads show a little good sense and quit attacking the coal industry. It is shown by the United States Geological Survey returns that the railroads have been inadequate to perform their duties as coal carriers. Even though strikes laid a few of the mines idle, the railroads could not have supplied the cars needed had the mines been working, or hauled the coal had it been loaded. So there was little coal lost from this cause.

And if we grant, what is not true, that every mine laid idle by a strike or a breakdown caused a reduction in tonnage at the market, the failure to supply cars was shown by the Geological Survey to be a far more important cause of shortage than the failure to operate the mines. That is, more days were lost from lack of cars than from the combined causes—strikes, other labor troubles and mine disability.

Again, the report of the Geological Survey, while made from information furnished by operators, is not really favorable enough to the coal industry. Many mines get a miserable quota of cars and report a run. The statistics based on such meager runs, though they convict the railroads of inadequacy, do not do it as convincingly as one might wish.

Should the same basis be taken by Teutonic statisticians, there could be found no shortage of food in Germany at present and with the same manner of reckoning there never will be any shortage conceded as long as every man has a meal or a part of a meal every day in the year. Statistically the Germans may starve to death and yet be accounted well fed.

The railroads, being wronged, have suffered; in consequence, they have been unable to take care of the coal industry. They deserve commiseration and assistance, but they will not get it if they deny the facts and assail the coal industry. Was ever so large an industry as ill advised as is the railroad business?

Anthracite Committee Promises Action

IT IS well that, at last, action has been asked of the anthracite operators. They have stood back for fear of prosecution and persecution, for fear their activity would arouse suspicion; but it was not because they did not understand the needs of the nation nor because they did not desire to alleviate them.

They are not pleased to see culm shoveled into cars as coal and paid for as if it were a superior article. They are going to see hereafter that the quality of coal delivered at the market is kept up to a reasonable level. We can see hard times ahead for those who want to ship all the rejects of old washeries as if they were good coal that needed no preparation. The bigger companies which use these "tailings" of former operation submit them to a further washing process that removes the rock with which they are mixed.

The committee also intends to try to discourage the use of anthracite where it is displacing bituminous coal. That is a good measure of the larger patriotism of the anthracite companies. They are putting an obstruction in the way of their own trade. It is to be hoped that, as a result of their activity, anthracite will not be shipped to regions where bituminous coal is more easily obtained. We trust that the army officer at a camp near a Kentucky mine, of whom we recently read, will not continue to get shipments of anthracite to satisfy his acquired taste for that smokeless fuel.

We may trust the anthracite operators to take a patriotic course in all they do. We wish they could do something for the straightening out of crooked retailing. It seems unnecessary that prices should be so high at local coal yards. It seems a right cause for suspicion when we find that local dealers refuse to sell to some of their customers, but will sell to ice men who peddle the coal around to those same customers at a high figure.

It seems unnecessary that long lines of shivering men, women and children with bags, baby carriages, go-carts and sleds should be lined up at the yards of almost every coal dealer. Even if coal is short why cannot orders be taken and coal be delivered at the house? A limitation on orders is always possible.

Unfortunately, the anthracite operators are setting bounds to their activity. They leave these retailing problems to the local fuel administrators, who seem to be neglecting them. Meantime the victimized public blames the big companies and overlooks as beneath contempt the peculators who carry away a money sack almost as large as the sack the poor man puts on his go-cart.

Who Is It Loads the Dirt?

JOHN P. WHITE, in a recent statement, has carried the modern doctrine of responsibility to its limit. The tendency of modernists has been to look entirely for the remote cause of wrong and to ignore the direct agent of that wrong, to condemn society and not the murderer, to exonerate the thief and condemn his employer.

Mr. White blames the operator for the bad coal in the market. He says, in effect, the operator is divinely appointed to see that the mine worker puts out clean coal. If the coal miner evades his contracted obligation, then it is due to the negligence of the wicked, careless and negligent mine owner. Such rascals should be held responsible for the poor coal the workingman is producing.

It is somewhat pitiful that Mr. White should deliver himself of such a statement; for if we were to reason after his manner in regard to his performance of his duties as head of the Labor Department of the Fuel Administration we could readily come to the conclusion that he is to blame for the bad coal now furnished. As head of that department it is his task to make the mine workers keep their contract, which includes the loading of clean coal. If they are not producing clean coal then he, himself, is the remoter cause of that delinquency. The more remote, the more reprehensible, is the modern doctrine to which Mr. White seems to subscribe. So Mr. White appears as the most reprehensible cause of the whole shortcoming of the coal industry.

Everybody knows that if the coal companies were to endeavor to enforce the clean-coal, or any of the clauses of its contract with the miners, it would have a strike or at least a heavy loss in its mining forces. All that can be done is to appeal to patriotism. With most men that is a remarkably strong plea, but with a few it is worse than useless. There are men who do not care for the interests of the nation. They do not favor John P. White, but they are members of the union, and many of them are strong enough, as Mr. White well knows, to make much trouble for any operator who would hold them to their contract.

It seems to us that the union, wherever there is a union, has a wonderful chance to create a wholesome spirit on the dirty-coal question. The union is surely more clearly responsible for the observance of the contract by its members than is the coal operator. It is the union which should stop the loading of dirty coal. The union's notices and the union's pressure should be active in suppressing the evil of which complaint is so general.

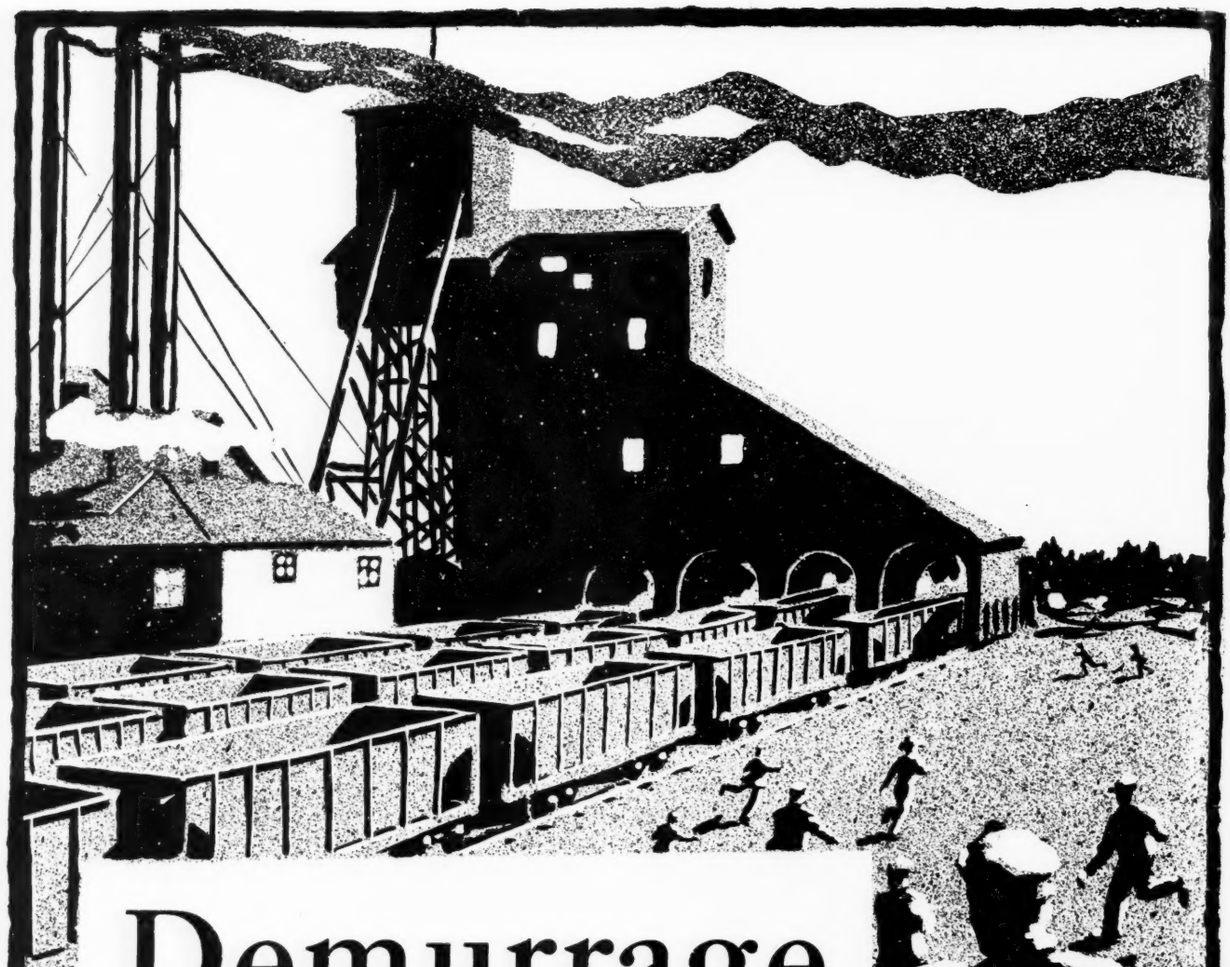
Producing clean coal is the work of the union and the work of the men. The contract proves it clearly. Let the union prove hereby that it is a national asset, that it is not established merely to filch a higher wage from consumers of all kinds—rich and poor—and to profiteer, but to secure essential justice between coal-mine worker, operator and public. Let it be well advised. On the road of good product and high ideals dwell esteem, progress and happiness, and on the road of irresponsibility and low aims will be found nothing but the contempt of the public, retrogression and regret.

Why the Wilsons and Garfield Did Not Go to Indianapolis

SOME people are disposed to think that British labor, and labor in general, is honored by Lloyd George's visits to labor councils. But it is a doubtful honor. Lloyd George was compelled to neglect his proper duties to conciliate men who were disposed to put their special interest above the interest of the nation.

The President of the United States, the chief of the Department of Labor and the United States Fuel Administrator did not go to Indianapolis, because they knew that the United Mine Workers of America was dominated by patriotic and intelligent men who could be relied upon to support the nation in its crisis. It is to the lasting credit of the mine workers that the Administration could address short letters to the workingmen in council and leave the whole matter in their hands without trepidation.

It is fortunately not necessary, though often it might be expedient, for the head officials of the nation to go touring the country to plead with any class of people, capitalists or workingmen. Their time can be given to the war and to the needs of the whole nation rather than to the demands of any particular trade. We have had a few strikes, it is true, but we are pulling together and we will pull together indefinitely if the truth, the whole truth and nothing but the truth is told by the press and the leaders on both sides.



Demurrage

(The crime of holding a railroad car idle)

THE war makes new crimes. A manufacturer or mine owner who holds a car a long time without unloading it has to pay a $10 per day fine. He is a criminal. After a while the Government may even provide a jail sentence for such people.

It's as bad an offense today to hold a car idle as it is to steal a pocketbook. No matter how hard it is to get the car unloaded or to get it loaded, and no matter how slow the railroad may be in hauling the cars, the man who is loaned a car by the nation must not keep it.

The miners are not required to pay any such fines. Anyway, they are going to do their level best to load cars as promptly as they can. No demurrage for theirs.

For this reason you will see the miners hustle to their work as soon as cars appear

LEON AKER

DISCUSSION BY READERS

First Aid to the Uninjured

Letter No. 2—I read the letter in *Coal Age*, Jan. 19, p. 156, entitled "First Aid to the Uninjured," by Charles Arnold, and want to say it should call forth a hearty response from a goodly number of mine foremen. It is a topic on which much can be said, and the opinions of these men may help to reduce the number of accidents in our mines.

As first aid to the uninjured, in my opinion, we need the following: Safe haulage roads; all machinery suitably safeguarded; sufficient pure air in circulation in the mine; miners' houses well built and equipped; educational facilities; and strict discipline in the mine.

To make the haulage roads safe requires rails of a size capable of carrying the loads that will be hauled over them; good ties spaced close enough to hold the rails firmly in their place and well ballasted. In short, the roads must be built in a good substantial manner. There must be plenty of headroom and at least three feet of clear space on one side of the entry, and this must be kept free of all loose material, as rock or timber, on which a man could trip and fall. Where there is danger of cars running away on a grade a suitable derailer or safety switch should be installed and kept in such shape that cars could not possibly cross it without being derailed. In this way, many serious accidents may be prevented.

The mine law compels operators to have a specified amount of air in circulation, for each man employed in the mine, but sometimes abandoned parts of a mine or portions temporarily idle do not receive the attention they should and the lives and safety of a large number of men are endangered. Too much care cannot be given to the ventilation of a mine.

The problem of housing miners and their families is receiving more attention today than it has in the past, and this certainly goes a long way toward aiding the uninjured. A good house with clean yards does quite a bit toward reducing accidents and sickness. We sometimes see mining towns with all sorts of rubbish lying about, pig pens in a filthy condition and no sanitary measures taken to keep filth and germs away. As a consequence, sickness and disease abound in those places.

Much can be done to make conditions in such communities better, by having lectures on the subject of sanitation and health, or by offering a prize to the family having the cleanest yard and neatest appearing home.

All men should be taught how to avoid accidents to themselves. Much can be done by posting safety bulletins with illustrations showing the different dangers men continually encounter, and giving instructions how to avoid them. A list of rules for the mine should be prepared and posted in several conspicuous places. These should be in different languages so all the miners could read them and know the requirements.

Last, but by no means least, a strict enforcement of the mine rules must be maintained if any good is to come from them. I feel sure that discipline is one of the most essential requirements to prevent accidents and avoid sickness. I do not wish to be understood as saying that all miners are careless and stubborn in respect to obeying the rules of a mine, which are made for their own safety; but too many of them are and their disobedience is often the cause of injury to themselves or to some other miner who is obeying the rules.

It is far better to discharge one reckless man than to have a dozen or more killed or injured by his recklessness and disobedience.

If every man would consider himself his brother's keeper there would not be as many armless and legless men in the coal districts, nor so many widows and orphans in hard circumstances. We should all make it our duty to prevent injury to a fellow workman in any way that the circumstances may demand.

J. H. TIPTON,
Hooversville, Penn. Mine Foreman.

Relative Size of Intake and Return Airways

Letter No. 4—In answering the examination question, "Which, if either, should be the larger, the main intake or the return airway? Explain why," *Coal Age*, Dec. 15, p. 1033, the editor stated that, under the conditions common to coal mining, the return airway of a mine should have a larger sectional area than the intake, giving as a reason for this statement, the expansion of the return current owing to its higher temperature, and the increase in its volume because of the presence of mine gases. It was further explained that the larger area was necessary in order to avoid an increase in the velocity of the current and an increased mine resistance.

In his letter, Jan. 5, p. 32, F. E. Schroyer says he does not agree with *Coal Age's* answer, and gives as a reason for his disagreement that the main haulage road of a mine should be the larger, on account of the cars passing in and out and obstructing the air currents. It seems to me that Mr. Schroyer is laboring under the supposition that the main haulageway is necessarily the main intake air-course, which is not always the case. As I understand the question asked and the answer given, such was not the case in this instance, and consequently the answer given in *Coal Age* is unquestionably the correct one.

Where the main haulway, in a mine, is also the intake airway, especially where there is a rope or motor system of haulage, it is true, as contended by Mr. Schroyer, that the passing trips of cars will obstruct the circulation of air more or less. The extent of this increased resistance will depend upon the speed of the traveling trips and the relative size of cars and entries. The empty trip going in with the current increases

the velocity of the current, while the loaded trip coming out against the current, decreases its velocity. I have often had occasion to observe this in taking air readings on an entry while the trip was in motion.

Assuming the haulageway is also the intake airway in a mine, I would be glad if *Coal Age*, or some one else who is able, would figure out and tell us whether or not the intake haulway should really be larger than the return air-course, as claimed by Mr. Schroyer and, if so, how much larger.

JOHN ROSE.

Dayton, Tenn.

Coal Production and Booze

Letter No. 4—I am glad to see that attention is being given to the booze question in its relation to coal mining. It would seem that some way should be found by which intoxicating liquor can be kept away from coal-mining camps and towns, especially at this time, when the Government is asking that every coal miner do his best to increase the output of coal from the mines.

It would surprise almost anyone, except those who by long acquaintance with miners have come to know their habits, to go into a mining camp and see how many of these men are out of the mine one or more days following payday. They would be inclined to ask the question, Is this patriotism? Some might even be inclined to wonder if there was not a pro-German spirit prevailing among some of the men. Their staying out of the mine certainly does not exhibit a spirit of patriotism and devotion to the cause or loyalty to the flag.

In its efforts for conservation why is it not possible for the Government to limit the shipment of liquors to mining districts, so that each district would receive a weekly or monthly allowance, which should be a prescribed percentage of their accustomed consumption? This would give but a small amount that each man could receive, and prevent drunkenness.

A PRACTICAL SUGGESTION WORTH CONSIDERING

Orders could be issued requiring saloonkeepers and bartenders to issue tickets to their regular customers that would restrict the number of drinks they could obtain in a given time. Such a practice was adopted and carried out by the food administrator during the recent sugar famine, when customers were only able to obtain a limited supply of sugar each week, on presentation of a ticket given to them by the store where they traded regularly.

If the same scheme could be put into effect in respect to the sale of liquor over the bar, in mining districts, it would go far toward keeping men in their places in the mine and in fit condition for work. The temptation to remain out of the mine a few days or a week, following payday, would be removed. Then with a little persuasion, not to say compulsion, on the part of the mine foreman and other mine officials, the production of coal would not fall off in the days immediately after the men receive their regular pay.

In the little town where I am living there is a population of 375 persons, and it is safe to say that there is shipped and brought into this place 200 gal. of intoxicating drink a week. All the men in the place are not confirmed drinkers, and this amount of liquor consumed by the remaining portion should be and is sufficient to greatly impair their work in the mine.

While I am not a temperance crank, I am fully convinced that to limit the supply of intoxicating drink is a good policy to pursue, at this critical time when our country needs the services of miners working in coal mines just as much as it needs men in the trenches. In order to win the war, for our benefit at home and for the generation to come, the soldier at the front is rated at $30 a day, 30 days in the month, and 24 hours a day. When these restrictions are forced on men of the draft age, why should not we be governed by similar restrictions that would make our efforts in the winning of the war as effective as those of the men called to the front?

To the man who is an habitual drinker, let me say in closing, Look around among your friends and near neighbors. One and another have sent their sons to the front to take your part and fight your battles. Then, ask yourself what are you doing to share this burden? Are you doing right when you stay out of the mine a day and fail to send to the top your share of the coal that is required to make the war a success and give these men at the front the support they should have from home?

I hope this matter of the supply of drink to the mining districts of the country will be so brought to the attention of the Government that they will take the necessary action to limit its effect on the production of coal.

JOHN BUGGY,
Mine Foreman.

Chambersville, Penn.

Shotfiring re Explosion

Letter No. 2—This subject of shotfiring and explosions, it seems to me, is worthy of more than passing comment, particularly since "Gas Inspector," who writes in *Coal Age*, Jan. 12, p. 71, cites an explosion that he states was "an explosion of powder smoke, intensified and propagated by coal dust," in which two shotlighters lost their lives.

This citation is given to refute the claim of Mine Inspector John Verner, that powder smoke produced in blasting contains so much carbon dioxide as to reduce the liability of an explosion being started.

In this connection I recall that Mr. Verner, in discussing "Shotfiring in Mines," Jan. 5, p. 33, advocates "a reduced circulation of air in the workings of a mine at the time of firing." This, he claims, lessens the liability of an explosion taking place. My own experience in the blasting of coal causes me to favor strongly increasing the volume of air in circulation at the time of firing rather than reducing it.

Considering the large number of shots that two men can fire in a mine, in a short period of time, it is clear that much carbon dioxide will be produced. But, on the other hand, if we consider the overheated atmosphere, charged with a considerable quantity of fine coal dust, there is presented just the conditions that favor the development of an explosion.

To depend on a reduced current of air to avoid such an occurrence appears to me as inviting disaster. Is it not true that, in a limited supply of air, a larger quantity of carbon monoxide will be produced, which will increase the explosive condition of the mine air? If that is the case, does it not follow that the cure suggested by Mr. Verner would seem to be worse than the

disease? My opinion is that no chance should be taken in this regard.

The use of a safety lamp by the rescuers, as described in the citation to which I have referred, would seem to indicate the importance of shotfirers working in a pure atmosphere. This would not be the case if the circulation is decreased before firing. The work of firing shots should start on the end of the air. If the circulation is slack, the shotfirers will then be compelled to work in an unhealthful atmosphere.

My conclusion is that in order to properly and safely perform this work it should be done in an abundance of pure, fresh air. All places where shots are to be fired should be sprinkled carefully with water before shooting, and a reasonable time be allowed to elapse between the firing of the shots. This, I believe, is the only safe practice in blasting coal. R. W. LIGHTBURN.

West Leisenring, Penn.

Letter No. 3—The incident given by "Gas Inspector," regarding an explosion in which two shotlighters lost their lives, *Coal Age*, Jan. 12, p. 71, calls to mind a similar instance in my own experience. For 24 years I have studied carefully the nature of gas and dust explosions, and want to say that the gases produced in the explosion of black powder, assisted by the presence of more or less gas issuing from the coal under the influence of the heat due to the explosion, form a very inflammable mixture.

In one instance, I remember firing a shot on the loose end of a crossheading in longwall work. The shot had been mined at the top. After firing it, I returned too quickly to ascertain the result and, sticking my light in behind the coal, was surprised by the gas igniting on the lamp. A considerable volume of flame was produced.

When working at Urpeth, in the "Busty seam," County of Durham, England, I recall that three or four men were killed in a local explosion that, according to the evidence given at the inquest, was due to the gases produced in the firing of the first shot being ignited by the flame of the second shot. As is usually the case, the force of the explosion was intensified by some marsh gas being present and by the coal dust blown into the air by the first shot. W. H. LUXTON,

Linton, Ind. Mine Foreman.

Letter No. 4—It is my opinion that the present-day methods of mining and blasting coal are responsible for the explosions that occur so frequently in blasting. Formerly, when this work was performed by experienced miners, more care was taken in placing shots; and the amount of powder in a charge was well gaged.

The use of squibs and the needle made it necessary to tamp the hole more thoroughly in order to be sure that the shot would go off. The working places were not as well ventilated then as they are today; more coal was broken by a single shot, and fewer shots were fired per man, each one doing his own shooting. The result was that the coal was properly mined, and a windy or blown-out shot practically never occurred.

Comparing these conditions with those that exist today in relation to the blasting of coal in mines, it is not difficult to determine the real cause of the frequent explosions that now occur at firing time, and which cause the death of so many shotfirers. The majority of these shots are improperly placed, poorly prepared and frequently overcharged. Fuse is generally used to fire the charge, which is often tamped with paper dummies filled with coal dust or other poor material and but loosely rammed into the hole. To add to the danger, the shots are fired in quick succession. It cannot be denied that these conditions favor the occurrence of a dust or hot-smoke explosion.

It has fallen to my lot to investigate five cases where explosions occurred as a result of blasting and which caused the death of three men and severely injured two others. They were all windy shots and dust explosions. It is worthy of note that these never occurred at the face of a deep room where there was ample space for the expansion of the gases, even though the rooms were poorly ventilated.

All the explosions to which I refer occurred in tight places at the head of entries and close to the intake, where a fairly good air current was passing. In addition to these experiences, allow me to cite a few instances that have come within my observation. The first of these is proof, to my mind, that poor tamping, or lack of sufficient tamping, will generally cause a blown-out shot.

LACK OF TAMPING CAUSES BLOWNOUT SHOT

A miner, in charging a hole in the face of an entry, chanced to ignite the fuse when he had but one dummy rammed in the hole as tamping. Finding that he was unable to extinguish the lighted fuse, he ran to notify the men in the other entry, and all escaped; but the shot blew out and tore up the entry for a distance of 200 ft. back from the face, knocking out crossbars and timbers, and throwing cars and tool boxes about in great confusion.

An hour and a half later one man was found overcome with the afterdamp and was taken out for dead, but artificial respiration revived him. Investigation showed that the shot was well prepared and would have done good work had it been properly tamped. It cracked the coal through the line of the hole; but the force of the blast was expended through the hole, and the coal was not broken down. Had these entries been filled with dust or hot smoke from a preceding shot, there is hardly a doubt but the result would have been much worse.

Another instance in which a shotfirer lost his life occurred as follows: A pair of entries were being driven on the strike of the seam and the rooms turned to the rise of the upper entry, the lower entry being the intake. All the shots were fired at one time, those in the upper entry being timed to go off first. There were but two shots in the face of the lower entry, and these were the last to explode.

UNBALANCED SHOT AND "DEAD HOLE" BLOW TAMPING

One of the shots in the lower entry was very heavy, measuring about 7 ft. at the point and 2 ft. at the heel, the hole being 7 ft. deep. This shot blew its tamping and slightly cracked the coal. The blast blew out the stoppings for a distance of 200 ft. back from the face, throwing great masses of rock and gob into the upper entry. The shotfirer was found dead at a point 300 or 400 ft. back from the face, his death being caused by the afterdamp.

Another instance was where four shots of dynamite were exploded, two being located in the face of each of a pair of entries. Two shots were placed in the center of each face, the holes being drilled straight in and 6 ft. deep, starting 18 in. from the floor and one shot being 18 in. above the other. Eight sticks of 40 per cent. dynamite were used, the intention being to make an easy place to put in a 6- or 8-ft. cutting. There is little doubt but the last of these shots to explode ignited the fine dust raised by the other shots, as the timbers, cars and tool boxes were badly burned, and charred coal and coke dust was in abundance everywhere.

Seven Shots Fired at One Time Cause Explosion

I will mention but one more case where an explosion occurred in which two men lost their lives and others were severely burned. Seven miners were driving a slope on a pitch of from 8 to 12 deg. An intake air-course was driven on each side of the slope and four new entries had been started, two being driven off each air-course, near to the face.

The new entries were each in from 20 to 30 ft. Seven shots were fired, all of which were charged with 40 per cent. dynamite, which it was the custom to use in tight shots, black powder being used only in open shots. The explosion occurred on the night shift, and set fire to the timbers and shifted the trapdoors for a considerable distance up the slope.

These incidents lead me to believe that a poorly placed shot, an overcharged shot, or one that is tamped improperly, will cause an explosion that will be greatly intensified in the presence of hot powder smoke or fine coal dust, especially if a fresh-air current is passing the place.

R. J. Pickett,
Shelburn, Ind. Mine Foreman.

Clearing a Heading of Gas

Letter No. 6—Having had considerable experience in moving gas, I have been interested in this discussion and would like to add a few words in addition to what has been said by others.

When making my rounds as mine examiner, a few mornings since, I proceeded with unusual caution as the fan had been stopped for two hours to make necessary repairs, and I expected to find trouble at some point in the mine, which was a very gassy one requiring the exclusive use of safety lamps.

On reaching a certain point in a cross-heading, I found, as I had expected, that the face of the heading was full of gas for a distance of 60 ft. back from the face. Fencing the place off with the usual danger board, I returned to the surface and reported the case, whereupon I was told to get a man to help me and move the gas.

It was my first experience in attempting to move a large body of gas and, entering the mine with my helper, I began to study how it was best to proceed. My first step was to throw all the air possible into that heading, and I arranged the doors and curtains accordingly. After a short time, my observations convinced me that this produced little effect and that other means would have to be adopted to move the gas, which was too strong for the air.

Therefore, starting from the outby rib of the last crosscut, I began setting a row of posts with a string of 2 x 4's above them against the roof, to enable me to hang the canvas to form a brattice. Having extended this brattice along the rib a short distance, I went back to the mouth of the heading to watch the result on the return side.

I found that the return air was a very explosive mixture and, in order to relieve this condition, returned to the crosscut and opened the curtain at that point for a short time. This had the desired effect of diluting the return current. By repeating the method of alternately opening and closing this curtain and extending the brattice by degrees toward the face, I was able to move the entire body of gas from that entry.

Moving a Large Body of Gas

My experience is that one should never attempt to move a large body of gas at once, but proceed to do this a little at a time. Another point that should be carefully borne in mind when moving a large body of gas is to carry it out of the mine by the shortest route possible. Never permit it to pass around the mine or through the working places when it is possible to give it another course. Get it to the shaft or slope bottom as quickly as possible. Then, after the gas has been removed, restore the ventilation to its proper course and examine the mine thoroughly to see that it is safe for work.

I agree fully with what Samuel Jones said in his letter, *Coal Age*, Jan. 5, p. 31, advising that the brattice should be set a sufficient distance from the rib of the entry to provide enough air space for the current to travel. As he explains, too small a space behind the brattice will choke the air current and reduce the quantity of air circulating in that split.

In my opinion it will have the same effect as a large roof fall on an entry if the attempt is made to force the air through a narrow space at the face. To move gas successfully one must have good ventilation, and this requires good air-courses and ventilating equipment.

Jacob Riley,
Bicknell, Ind. Mine Examiner.

Blacklisting To Prevent Accident

Letter No. 9—Permit me to say that I am strictly against the idea of "blacklisting" a man who has been careless or reckless in his work. The only condition that would induce me to put a man on the blacklist would be drunkenness, which cannot be tolerated in coal mining.

Because a man is careless, at times, is not to say that he is a hard man to work with, or that he is inclined to disobey the orders of the mine boss. The man is not always lazy; he may be inclined to take a chance, which is common with most miners. They put the longed-for dollar before safety, but the same thing can be said of a large majority of mine officials and operators.

My belief is that many mine bosses (foremen) fail to realize that they hold their position because they are supposed to have a superior knowledge of mining, and it is their duty to give their best to the workmen in their charge. Especially is this true with regard to the prevention of mine accidents.

A mine boss should strive in every way to prevent the occurrence of accidents, not because the law demands it but because of the loss to the operator and the injury to workmen. When a miner neglects to make his place safe by setting the necessary timbers as ordered, the easiest way to bring him to time is to stop his turn. He will not delay long, then, to set the timbers required.

Since coming to this country, eight years ago, I have worked in one mine six years, for the reason that I concluded the mine was fairly safe, although my place was not visited by the mine boss as often as was the custom in England, where the deputy (fireboss) visited each working place daily. When employed as deputy, in the old country, I would often visit a man's place three times a day.

Machine Men Fail to Reset Post Under Bad Top

An instance that occurred not long since illustrates the need of more frequent supervision of miners' places to avoid accidents. I had set a good timber to protect me while loading some machine-cut coal, in a room where the roof showed a very distinct slip. The coal was hauled away and a fresh cut made with the machine. On returning to the place, I found that the timber had been removed to operate the machine and had not been reset.

Seeing the post lying where it had been thrown, I remarked to my buddy, "Now, George, it has gone well this time, but that won't always be the way"; and my words proved true, for a few months later, one of the machine men was caught by a fall of slate and killed. Yet it would be hard to find a more careful, steady and industrious man, although he was somewhat venturesome. The thought came to me, then, very forcibly, that the only way to prevent such accidents is to inspect the working places more frequently. It was the first fatal accident in that mine.

Accident Impresses Need of Closer Supervision

The second fatal accident occurred not long after, when a close friend of mine was caught and killed by a fall of slate in his room. At the time I was one of the mine committee. Our committee and the mine inspector had considered the place well timbered, and I could not help thinking that the accident might have been avoided by a more frequent inspection of the place, as danger may often develop in a short time at the working face.

So deeply was I impressed with the thought that more frequent inspection was needed, that my contention in this regard angered the mine boss, and I might have been blacklisted if that method had been in use at that time. At each of the fatal accidents mentioned it so happened that the room boss for the section was away at the time, and his duties were supposed to be performed by the boss of another section, who was thus compelled to do double work.

While room-bossing at one time, I started the practice, in the mine where I am now employed as a miner, of making more frequent visits to the working places. I am glad to say that this practice is still continued and there has been but one fatal accident in this mine in eight years.

The remark is frequently heard that "a mine boss is expected to do as much as two ordinary men." It is my opinion that, when this is the case, the operator is the loser in the end. My advice is to give mine bosses more opportunity to visit the working places and instruct the men and see that they keep their places safe for work. In this way good results are sure to follow.

Linton, Ind. MINE FOREMAN.

Letter No. 10—Having worked about the mines during the last 25 years, mostly as a miner, I was somewhat surprised to read the article advocating the blacklisting of miners for carelessness, neglect or disobedience to orders, which has been under discussion in *Coal Age*.

It is strange that blacklisting should be considered for any purpose whatever, and least of all for the purpose of promoting safety and getting men to work more steadily.

The book system for keeping a man's record, as suggested by Gaston Libiez, in his letter, Jan. 5, p. 29, in my opinion is only another method that is calculated to do much harm, not only to the workmen but to mine foremen as well. It is stated that the method proved successful in France, but I believe it would not work in this country.

An Obstacle to Blacklisting

Every man has his friends, and all men are not of the same mind or temperament. For this reason, a man may work well under one foreman, while he fails to suit another foreman. In time a good miner will work for a large number of foremen, good, bad and indifferent. He may quit a place of his own accord or he may be fired for some slight cause or because of prejudice. The record entered in the book may be just or unjust, according to the relation of the man to his boss and, for this, the workman is not always responsible. There was a time when I would have scorned to ask a foreman to fix my book so that I could secure employment elsewhere.

In reading different letters on this subject, that of Robert A. Marshall, Jan. 12, p. 74, appeals to me as setting forth the more sensible method of procedure in the management of men. Mr. Marshall advocates showing appreciation of a miner's efforts to make his place safe and says that this is "a big incentive to him to continue so doing." In my opinion a word of commendation when merited, as well as a deserved rebuke, comes closer to the mark than keeping a man's record or blacklisting him. My motto is, Treat men as though they were human.

Many times, when instructing a miner or his laborer to do or not to do a certain thing, a little explanation of the why and the wherefore will prove a great help, as the man then sees the reason why he should do as he is told and is more inclined to obey.

Most men can be brought to the place where they will do what you want them to do if judgment and tact is used in instructing them. Driving men under the lash was abolished more than half a century ago. Our fathers fought to free the slaves, and this is reason enough to make our blood boil at the mere mention of serfdom. Fairness will accomplish more than force.

Bolivar, Penn. W. H. CLARK.

[This letter will close the discussion of blacklisting to prevent mine accidents.—Editor.]

INQUIRIES OF GENERAL INTEREST

Dynamos and Motors

Kindly explain the difference between a dynamo and a motor. Can a dynamo be changed into a motor, or a motor be made into a dynamo? I am referring now to direct-current machines. I have heard these terms used so indifferently that I am much confused in regard to their proper application. MINE MECHANIC.

Johnstown, Penn.

It is true that the two terms, dynamo and motor, are used very indiscriminately in practice. The word "dynamo" is an abbreviated form of "dynamo-electric machine" and originally referred to a device by means of which mechanical energy can be converted into electrical power.

The dynamo consists of a series of coils of wire forming a conductor and mounted on a shaft in such a manner that they can be rotated in a magnetic field. Briefly stated, the principle of the dynamo is that when an electrical conductor is made to cut the lines of magnetic force an electromotive force is generated, which causes a current to flow in the conductor when the circuit is closed. The coils mounted on the shaft are called the "armature" of the machine.

It was found, however, that this machine, familiarly called a "dynamo," was capable of being operated in two ways: For example, when the armature was rotated by power applied to the armature shaft an electromotive force was generated that caused a current to flow through the conductor whenever the circuit was closed. On the other hand, it was found that when connection was made, allowing a current to pass through the conductor, the same reaction took place between the live conductor and the magnetic field of the machine and the armature was again rotated.

It is important to notice that, in the first instance, mechanical power was applied to turn the armature and the electromotive force generated then makes the dynamo, properly speaking, a "generator." In other words, a *generator* is a dynamo-electric machine, or simply a dynamo, operated by mechanical power and producing electrical energy.

In the second instance, on the contrary, the electric current sent through the conductor that composed the armature windings made the dynamo a prime mover, thereby converting electrical energy into mechanical power. In this case, therefore, properly speaking, the dynamo is a *motor.*

It is evident, therefore, replying to the question of whether a dynamo can be changed into a motor, or a motor into a dynamo, that a dynamo may be employed either as a generator or as a motor, according to the manner of its operation. As a generator, the input is mechanical power and the output electrical; while, as a motor the input is electrical and the output mechanical. In either case the dynamo is not an independent source of power but a means of converting one form of power into another. It is this fact that gives the word a broad application, which is sometimes mistaken for a misuse of the term. To be specific, a dynamo should be spoken of either as a generator or a motor, which would designate its use.

Flow of Water in a Ditch

I have been working over what seems to be a simple question and yet have not been able to satisfy myself as to the correct answer. I have submitted the question to others and their results vary from 14,000 gal. to almost 5,000,000 gal. in 24 hours. Kindly show what quantity of water will flow in a ditch 20 in. wide on top, 10 in. at the bottom and 8 in. deep, in 24 hours.

Renton, Wash. STUDENT.

The question is incomplete, as it does not state the mean velocity of the water flowing in the ditch. In a small ditch of the kind here mentioned the mean velocity of the flow for the entire cross-section of the ditch may be taken as approximately 0.9 of the observed surface velocity.

For example, assuming that a surface float, in this ditch, was observed to pass over a distance of, say 100 ft. in 30 sec., the observed surface velocity would be $60/30 \times 100 = 200$ ft. per min. and the mean velocity of the flow can be estimated as $0.9 \times 200 = 180$ ft. per min.

Again, assuming the ditch is running full of water or that the surface of the water is 20 in. wide and its depth 8 in., the wetted cross-section of the ditch is then $8 \times \frac{1}{2}(10 + 20) = 120$ sq.in. On this basis the quantity of water flowing in the ditch in 24 hours is

$$\frac{24 \times 60(180 \times 12)120}{231} = 1{,}615{,}790 \; gal.$$

The estimated quantity of the flow will vary with the assumed mean velocity, which is here taken as 200 ft. per min.

Handling a Gob Fire

Please state if water should be used to extinguish a gob fire that has gained much headway.

McAlester, Okla. MINE FOREMAN.

Assuming that the fire has spread over a considerable area in the gob, it will be impracticable to load out the burning material and, in order to extinguish the fire under these conditions, it will be necessary to seal off the places so as to exclude air from the fire. Having done this, time must be given for the fire to die out, which will be when all the available oxygen supporting the combustion has been consumed. The use of water for extinguishing a fire in the gob will generally only make matters worse, as the moist material will heat and the trouble be extended.

EXAMINATION QUESTIONS

Alabama First-Class Examination, Birmingham, Jan. 21-24, 1918

(Selected Questions)

Ques.—Describe the continuous-current system of ventilation.

Ans.—Where a mine is ventilated by a single current of air that is not divided at any point of its passage from the intake to the return opening of a mine, the system is called a "continuous-current system" of ventilation. This system is only adapted to the ventilation of small mines having but few working places.

The efficient ventilation of larger mines requires that the air current be split one or more times in its passage through the mine, the purpose being to prevent the gases generated in one section of the mine from being carried into other sections of the mine. Also, a larger quantity of air is circulated by the same power. This is called the split system of ventilation.

Ques.—What are the advantages and disadvantages of the split-current system?

Ans.—The advantages of splitting the air current in a mine, are that less power is required to circulate a given volume of air; fresher air is supplied to the working places and the circulation is under better control, as the quantity of air supplied to each section of the mine can be proportioned to the needs in that section; the velocity of the air current passing the working places is reduced and causes less inconvenience to the workmen; an explosion occurring in one section of the mine is less apt to be carried into another section; and, finally, splitting the air current avoids the necessity of doors on the main haulage roads.

The only disadvantage, if such it can be called, of splitting the air current in mines is the necessity of building air bridges or air-crossings at points where the air is split and where it is required to conduct the current over the parallel entry.

Ques.—How would you proceed to reënter a heading with safety, after an explosion has occurred therein?

Ans.—The first step is to withdraw all the men from the mine before any attempt is made to enter the heading in which an explosion has occurred. Only safety lamps of an approved type must be used. The circulation must be increased and the mine entered by following the intake air, making frequent tests with the safety lamp to ascertain the presence of afterdamp or any remaining firedamp, which often drains out of the rooms, after an explosion has occurred in other rooms or at the face of the heading.

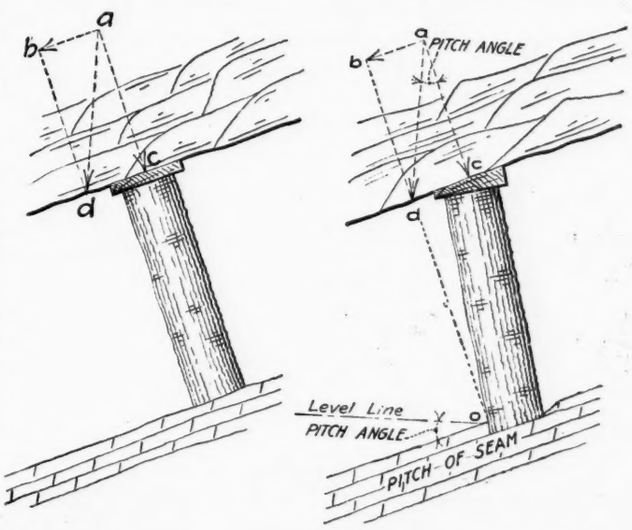
Proceed slowly, taking every precaution to avoid being entrapped in gas issuing from the rooms. The fresh air current should be conducted by brattices, if necessary, and made to sweep the working faces and other void places where gas may have accumulated. Continue in this manner until all the gas has been removed from the rooms and the heading.

Ques.—What proportion of firedamp in an air current forms an explosive mixture of the least dangerous character?

Ans.—The least dangerous explosive mixture is that where the proportion of gas to air is 1: 13, which is the lower explosive limit of marsh gas. As the proportion of gas to air is increased, the danger increases. Firedamp mixtures above the maximum explosive point are more dangerous than those below that point, because the addition of any air to those mixtures renders them more explosive. On the other hand, the addition of air to firedamp mixtures below the maximum explosive point renders the mixture less explosive.

Ques.—Show by sketch the difference between properly and improperly set timbers on a 30-deg. pitch.

Ans.—The accompanying figure shows two posts set on a steep inclination. The post on the left is set normal



RIGHT AND WRONG METHODS OF SETTING POSTS ON AN INCLINE

in the seam and, in this position, the slightest movement of the roof, by which it tends to slip down the pitch, will loosen the post. This is the improper method of setting a timber on a pitch.

The post shown on the right of the figure is "underset"; that is to say, the head of the post is inclined up the pitch at a slight angle from the normal in the seam. In this position, it is evident that any movement of the roof downward in the direction of the pitch will tighten the post. The foot of the post is set in a shallow foothold cut in the floor of the seam.

Ques.—Is it safe to pass a current of intake air through the abandoned portions of a mine and then conduct it to the face of the workings?

Ans.—This should never be done, for the reason that the abandoned portions of a mine are liable to contain accumulations of blackdamp or firedamp, which would be absorbed by the current and carried past the working faces, making the mine unhealthy or dangerous.

COAL AND COKE NEWS

What Happened in January

Jan. 10—M. L. Requa is given full charge, under the direction of Dr. H. A. Garfield, of the activities of the Fuel Administration in connection with oil.—To save fuel, manufacturers of boxboard, paperboard, strawboard, pulpboard, binder board, tag board and other like boards agree to close down from 7 a.m. on Saturdays till 7 a.m. on the following Monday.

Jan. 12—Dr. H. A. Garfield demands that the Alabama Coal Operators' Association accept the Fuel Administrator's decision, already approved by the mine workers Dec. 21 of last year.

Jan. 14—Authority to divert coal and coke to meet emergency demands was conferred on State Administrators by Dr. H. A. Garfield, United States Fuel Administrator.—Senate passes Walsh-Pittman coal and oil-lands leasing bill for the general leasing of coal, phosphate, oil and gas, and sodium lands.

Jan. 14—Frank S. Hayes and nine other officials cited to show cause why they should not be declared in contempt for violating an injunction restraining representatives of the union from attempting to organize the employees of the Hitchman Coal and Coke Co., in West Virginia.

Jan. 15—United Mine Workers of America convene at Indianapolis, Ind., in biennial convention.

Jan. 17—"Workless" five days commence under order of Dr. H. A. Garfield.—M. L. Requa announces that the drilling and operating of oil or gas wells and the transporting, manufacturing or distributing of petroleum and its products or of natural gas is not to be restricted on the days appointed for suspending operation in other forms of industry.—H. A. Garfield telegraphs J. P. White, saying that the mines would not be shut down on the "workless" days. A long list of exemptions was published.—Francis S. Peabody testifies before the Senate Investigating Committee urging the necessity for clean coal, the need for the zoning of the coal industry and suggesting a price for coal based on coal thickness.

Jan. 18—Garfield adds another long list of firms exempted from the "Workless Days" order.

Jan. 21—First "Workless Monday."—United Mine Workers of America approve by vote of convention the Washington agreement signed on their behalf by the International officials of the union, Oct. 6 of the last year.—Interstate Commerce Commission approves under certain conditions refusal of the Baltimore & Ohio Ry. to supply coal cars to wagon mines.

Jan. 23—Explosion at Stellarton, N. S., at the Allan shaft of the Acadia Coal Co. Eighty-seven men are said to have been killed.

Jan. 24—J. D. A. Morrow appointed commissioner with the title of Manager of Apportionment and Distribution for the zoning of all fuel except petroleum.—Anthracite operators pool all coal at New York City.—The Fuel Administration reduces the prices for run-of-mine coal and prepared sizes produced in the Deerfield or Palmyra fields and the Massillon and Jackson fields in Ohio, 5c. per ton. (It would have been 50c. had the price not been offset by the 45c. increase.) However, the price of screenings is raised 45c.

Jan. 25—Fuel Administrator Garfield announces his coal distribution plan.—E. R. Stettinius appointed Surveyor General to the Army. He will make all purchases for military purposes.

Jan. 26—Mine Workers Convention comes to an end after having given the mine workers of all the states a word in the making of the contract of the Central Competitive Region.—Fuel Administrator forbids all unusual hours of labor introduced to evade the law relating to workless days and prescribes exceptions to the workless day provisions.

Jan. 29—Alabama operators agree to comply with the terms of the agreement proposed by the Fuel Administration through Rembrandt Peale and declare they will not recognize the union but will increase wages if necessary.

Harrisburg, Penn.

During the week Mr. Potter, state fuel administrator, seized many cars of coal destined to points outside of the state, among the cars being 1300 tons for the Weller Coal Co., at Jacksonville, Fla. That Mr. Potter's seizure of the Florida coal will "start something" in Washington, is held by virtually all interests close to the coal trade. It is known that such a move has been in contemplation by the fuel administration for some time, on advice of coal men called in as consultants. The need for drastic action, it has been pointed out, existed from the moment Dr. Garfield gave ear to the needs of New England, at the same time openly disregarding the situation in Pennsylvania.

Since the normal methods of distribution have been superseded by instructions from Washington, coal shippers do not know where they are at. Shippers contend that the way things are going at the present time there is no way of knowing, apparently, whether coal is stuck away in some railroad congestion or whether it has been confiscated for railroad or Government use.

On Jan. 29, Mr. Potter sent telegrams to all Pennsylvania representatives and senators and A. Mitchell Palmer, alien property custodian, and Vance McCormick, chairman of the War Trade Board, charging that the orders of Dr. Garfield giving priority to coal for New England has caused the present acute situation in Pennsylvania.

Pennsylvania members of the House held a meeting after receiving Mr. Potter's telegram and appointed a committee headed by Representative J. Hampton Moore, of Philadelphia, to confer with Dr. Garfield and William G. McAdoo, director general of railroads.

Dr. Garfield was interviewed by the committee and entered into a lengthy explanation of the fuel situation. He said the so-called priority for the benefit of New England did not prejudice Pennsylvania, and produced statistics showing that Pennsylvania's supply of anthracite had increased in larger proportion than that of New England or New York. In the course of the interview with Dr. Garfield, it was learned that preparations were being made for a systematic all-the-year distribution of coal during the period of the war. As to immediate relief for Pennsylvania, however, Dr. Garfield declared that the situation was being given close attention, and that conferences were being held and would continue, looking to some alleviation of the situation, which had been presented by the protestants from this state.

At a meeting of the Anthracite Board of Miners' Examiners on Feb. 1, it was decided that the members use their own discretion in giving miners' certificates to those applicants who qualify, whether they are natives of countries now at war with the United States or not. During the session certificates were issued to a number of Austrians and others, officially classed as alien enemies, who declared that they were not enemies but loyal and supporters of this country, although not as yet naturalized citizens.

Since the judges refused citizenship to natives of countries at war with the United States the members of the examining board have questioned the advisability of granting miners' certificates to such aliens.

Little or no seditious talk has been heard from mine workers in the anthracite region. Most of the employees seem content and satisfied with wages and conditions, and while a big majority of the workers are natives of alien countries, they are giving no trouble and are getting out as much coal as possible.

A movement has been inaugurated to reopen the Schuylkill Canal on a large scale. Petitions will be presented to the Government asking to have this waterway opened for transportation. The plan is to have the canal open to transportation of coal between Port Clinton and Philadelphia. It is believed that were the canal open the coal problem would be taken care of with ease. Thousands of tons could be moved cheaply, when ice did not obstruct navigation.

The canal is owned by the Schuylkill Navigation Co., and its purchase by the Reading Railway Co. and the virtual closing down of these water transportation facilities greatly increased the freight for the railroads. At one time 800 boats used the canal. Last year there were twenty-five.

Men connected with the state government are giving their help to the movement to have the National Government revive the canal. State engineers have made surveys and will tender their assistance. The Atlantic Deeper Waterways Association is also urging the reopening of the canal.

A ruling that "no employer or insurer has a right to stop payment of compensation until he has fully complied with the provisions of the act and the rules of the board" was announced by the Board of Compensation Commissioners in the case of Betzer vs. Gluck. The claim was made for compensation for death of a driver kicked by a mule when the former was in a tubercular condition, the injury hastening death. An agreement was entered into for payment of compensation and the employer paid it for a time and then stopped. The board orders full compensation payments made and the defendant also to pay the costs.

PITTSBURGH, PENN.

The thaw the latter part of last week started the ice to breaking in parts of the western Pennsylvania rivers, resulting in several ice jams and gorges, which did considerable damage to coal property. A number of barges and several towboats were sunk. The river end of the Diamond mine of the Diamond Coal Co., in the fifth pool of the Monongahela River, just above Brownsville, was carried away when the ice in that pool broke and gorged at the dam. The Hecla mine, of the Hecla Coal and Coke Co., suffered a similar fate and the Isabella-Connellsville mine, of the same company, had their big steel tipple moved three feet out of line.

The cold snap this week checked the breaking up of the ice and prevented serious floods and worse damage from the ice. Since the middle of the week every available towboat has been working up the Monongahela River, breaking up the ice and allowing it to move slowly out to give a clear way for the big gorge in number five pool above Brownsville, when it breaks and moves. The way is now clear to that point, and river men are considering using dynamite to start that gorge moving gradually before the river falls enough to allow it to settle.

PENNSYLVANIA

Anthracite

Plains—Scotch Hill and North Main St. sections continue to suffer from the effects of settling caused by mine caves in the workings of the Madera-Hill Coal Co. Residents of houses endangered by the settlings report that they are unable to find suitable vacant houses in other parts of the township and are, therefore, in imminent peril of being forced out of their homes at any hour of the day or night, and in any kind of weather.

Edwardsville—With officials of the coal-mining department of the Delaware, Lackawanna & Western Railroad Co. as guests of honor, a dinner was given by the officials of the Woodward colliery of the Lackawanna company. The dinner was held in celebration of the record output, a trifle over 1,200,000 tons of coal being mined at the Woodward during the year 1917. The output was the greatest in the history of the colliery.

Mount Carmel—To aid in breaking the coal blockade, the Philadelphia & Reading Coal and Iron Co., on Jan. 29, suspended operations at four of its largest collieries in this district and assigned about 1000 laborers to the Reading Railway Co. to aid in releasing long trains of coal from snow and ice-bound sidings. Railroad officials stated that as a result of the suspension at the mines and the opening of the sidings, coal shipments were moving with satisfactory regularity.

Carbondale—Fire destroyed a building near an air shaft leading into the workings of the Rackett Brook Coal Co. on the East Mountain on Jan. 28. Employees of the company tipped the building over from the shaft, so that none of the smoke could descend and cause disorder among the men who were working on the night shift in the mine.

Scranton—In suits filed in the county and federal courts on Jan. 31, damages to the amount of $72,000 are asked from the Clearview and People's Coal companies, over whose workings occurred settlings that have wrecked numerous homes. Attorneys who filed suits for the Scranton Surface Protective Association believe the cases will establish the illegality of the so-called waiver clause on deeds held by persons who purchased ground from the operators.

Oneida—Lehigh Valley Coal Co. detectives are investigating an attempt to fire the double dwelling occupied by Mine Superintendents Thomas Burns and James Ulshafer. The attempt was made during the night of Jan. 30, and but for the timely observation of the blaze by the watchman disaster would have resulted. After the blaze had been extinguished, investigation revealed the presence of a quantity of cotton waste and an empty bottle that had been filled with kerosene oil.

Lattimer—It cost $400,000 for the firm of Coxe Brothers & Co., Ind., to open the big strippings here. These are now showing signs of exhaustion and can only be operated about three years by the Lehigh Valley Coal Co. The strippings were started in 1900 and finished in 1904, while the Coxes still operated the chain of collieries now run by the Lehigh Valley Coal Co. When the first ten cars of coal were hoisted up the planes from the exposed veins, the late Edgar Kudlich, then general manager of the Coxe interests, remarked to an associate engineer that each car had cost the Coxe company $40,000. That the outlay paid is shown by the fact that the Lehigh Valley Coal Co. has taken 1,800,000 tons of coal out of the excavations so far. Lattimer strippings are among the show places of the Lehigh region, exposing veins of fuel 80 ft. thick and through which tunnels have been driven.

Bituminous

Connellsville—Removal of rib coal from under homes in Crawford Ave. by the H. C. Frick Coke Co., has resulted in the collapse of a number of foundations and damage to the houses otherwise. The purchase of the coal by the coke company antedated that of the surface by the householders, and there is apparently no redress. Notice was served on the property holders when the company began its final drive in that portion of the Davidson mine, as a precautionary measure.

Brownsville—Virtually every tipple of any importance, from Masontown to California, has either been swept away or greatly damaged by three enormous ice gorges in the Monongahela River. The damage done will mount up to many hundred thousand dollars.

Johnstown—Six men had their lives crushed out and traffic on the Pennsylvania R.R. was embargoed for hours on Feb. 1, when an overhead carrier used for conveying coal at the Cambria Steel Co.'s plant at Conemaugh, together with a bridge, fell. Freight traffic on the Pittsburgh division of the Pennsylvania was paralyzed for hours. Thousands of tons of coal consigned to points on the Atlantic seaboard were stalled as train after train was held up west of the wreck.

Nant-y-Glo—Ten families were made homeless and some of them destitute on Jan. 30, by a blaze of five double dwellings, along with a small store building, in which the fire started from an overheated stove. The houses were owned by the Warren Collieries Co. Owing to the snow-drifts and a shortage of water, the firemen were helpless.

Somerset—Forty miles of track on the Berlin, Salisburg and Boswell branches of the Baltimore & Ohio R.R., which have been blocked with snow for almost a week, were cleared on Jan. 29 by more than 1000 coal miners, who rallied to a call issued by the Somerset Coal Operators' Association. The miners were assisted by several hundred men furnished by the railroad company. The tracks were buried for a depth of six feet in many places.

Brownsville—Nearly 200 miners were removed from the shafts of the Fifth Pool Coal Co. near here on Jan. 30, when the rapidly rising waters of the Monongahela River approached within several feet of the openings. The shafts are 1200 ft. from the river, but the water, backed up by an ice gorge, quickly covered the lowlands.

WEST VIRGINIA

Newburg—The Virginia-Maryland Coal Co., of Adamston, W. Va., is closing down and abandoning its Newburg shaft. This operation is located in Harrison County, on the Baltimore & Ohio Railroad.

Elkins—A great ice gorge in the Tygarts Valley River, just below Junior, has backed up the water to such a depth that the fires of the West Virginia Coal and Coke Co. ovens have been drowned out. Several residences and stores have been flooded, and if efforts now being made to dynamite the gorge are not successful, heavy property loss is likely to result. At Belington a gorge is said to have formed just below the town, causing all the lower portion to be flooded.

Charleston—The West Virginia Coal and Coke Co. has furnished service flags to each of its plants, and one for its general office located in Elkins. Records show 47 employees having reported to the colors, and at least that many more awaiting orders.

ALABAMA

Birmingham—At the regular semi-annual examination of applicants for certificates as first- and second-grade mine foremen, and fireboss, recently held in the office of Chief Mine Inspector C. H. Nesbitt, sixty-nine applicants were successful in standing the tests. There were eight failures out of the total of 77 in the class.

OHIO

Byesville—Fire which is believed to have been caused by the explosion of a bomb, practically destroyed the tipple of Little Kate mine No. 1 of the National Coal Co., on Jan. 30, with a loss conservatively estimated at $50,000. The first intimation of trouble came when a muffled explosion was heard in the top of the building, and an instant later the huge structure was enveloped in flames.

Crooksville—Zanesville Coal Co. mine No. 6 was idle on Jan. 29, on account of the icy condition of the railroad tracks, making it impossible for the Pennsylvania work train to reach the mine. Several Crooksville mines are badly handicapped on account of lack of water for boiler use, and others have been idle on account of lack of cars for freight shipments.

ILLINOIS

Benton—The cage at the Benton Coal Co.'s mine here dropped 200 ft. with 11 miners on it, caused by failure of the engine to work properly. It is astounding in that no one was killed, but all suffered broken limbs and internal injuries.

B. F. Foster, J. W. Boyle, Dr. W. T. Short and William White, all Stonington men, have purchased the Blue Mound coal mine and intend to be ready for business soon. The work of pumping water from the mine has already been started. There is considerable rebuilding to be done before operations can be resumed.

Stonington—An explosion in Mine No. 21, owned by the Peabody Coal Co., on Feb. 1, killed three men. It was caused by escaping gas from an entry in which fire had broken out the day before and which had been walled up. The men who were killed, Jack McLaughlin and William Barker, of Stonington, and Walter Crouch, of Blue Mound, were in a working party that was making repairs. Thirty men who entered the mine after the explosion in an attempt to reach the bodies were driven back by the gas. Dick Clements, another member of the working party, was found an hour after the explosion wandering about the mine in a dazed condition. The bodies were finally recovered by a squad from the Springfield rescue station.

Lincoln—The Lincoln Coal and Mining Co. is renewing its efforts to reach and extinguish the fire which has necessitated sealing the mine for several months. Openings have been made to secure a freer circulation of air when the fan is again started and an effort is being made to locate the spot where the fire is still smoldering.

WYOMING

Kemmerer—No. 1 mine of the Union Pacific Co. at Cumberland, which some time ago had a squeeze, causing the company to allow the lower levels to flood, is to be pumped out. The new pump has already arrived and it is expected that from 50 to 100 more men will eventually be accommodated.

Casper—A meeting was held last week to organize a branch of the American Mining Congress. About 100 delegates attended from different points in Wyoming. The next meeting will be held at Cheyenne.

Foreign News

Amsterdam—It is announced that the Dutch government has stopped the importation of coal from Belgium, on the ground that Holland does not consider herself justified in accepting coal mined by compulsory labor.

Calgary, Alta., Can.—Miners in Alberta coal mines will be given exemption from military service so long as they work, Mr. Justice Simmons, of the military tribunal, has announced. If they strike or take holidays, the exemption ceases.

London, Ont.—The coal shortage here has raised the price of coal from $12 to $16 a ton. Many of the citizens are complaining against the dealers for charging $16 a ton for coal in quarter-ton lots, but the latter argue that owing to the shortage they have to bring in the aid of brokers and have to use other than ordinary channels to procure the coal, which makes the cost much greater.

New Glasgow, N. S.—Coroner Kennedy of New Glasgow has been empaneled to inquire into the deaths in the Allan mine explosion. As the jury did not have at least three miners in its panel, R. H. Murray, who represents the men, asked for an adjournment and a new jury. On Jan. 31 there was 4 ft. of water at the 1200 ft. level and three pumps had been installed to remove the water. Up to that date 43 men had been taken out of the mine.

Harbin, Siberia — The Tehermovo coal mining district, 70 miles from Irkutsk, Siberia, has been laid waste by order of the local Bolsheviki authorities. The district produces 2,000,000 tons of coal a year, supplying the Siberian Ry. The damage is estimated at 10,000,000 rubles. Many Austrian and German prisoners were working at the mines.

Personals

J. G. Vaughan has been made general superintendent for all the Beury mines in the New River coal field, of West Virginia. His headquarters will be at Nuttallburg, Fayette County.

Fred H. Smythe has resigned his position with the Richland Coal Co., of Moundsville, W. Va., to accept a position as superintendent at the Conklin Coal Co., at Coshocton, Ohio.

John McGregor has resigned his position as manager of the Rutland, Ill., mine of the United States Coal and Coke Corporation, and is succeeded by G. W. Harley, whose former home is in California.

Herman V. Hesse, for ten years manager of the Maryland district of the Consolidation Coal Co., has resigned, effective Mar. 1, to become manager of the coal operations of the Monongahela Traction Co., with headquarters at Fairmont, West Virginia.

Harry Phillips, formerly a mine foreman in the employ of the Consolidation Coal Co., which has mines in Maryland, West Virginia, Pennsylvania and Kentucky, has been appointed superintendent of the Hartland Colliery Co., whose operations are in Clay County, W. Va.

P. M. McClanahan, formerly president of the Milburn Coal Co., operating in the Paint Creek field of Kanawha County, West Virginia, has organized the Caudil Branch Coal Co., to develop a lease on Caudil's branch in the Hazard field, Kentucky. The company controls about 2000 acres and is capitalized at $400,000.

J. B. White, general manager of the West Virginia Standard Coal Co., of Huntington, W. Va., regarded as one of the best authorities on traffic in the country, has resigned his position, effective Feb. 1, as general manager of the West Virginia Standard Coal Co. to take charge of the traffic department of the Cleveland Furnace Co., of Cleveland, Ohio

Major O. B. Perry, of the 27th Engineers, the mining regiment, has been promoted to the rank of lieutenant colonel. He now is at Camp Meade and as the ranking officer is in command of the portion of the regiment which is being trained. Before the regiment leaves for France, it is expected that a colonel of the regular army engineer corps will be assigned to the regiment.

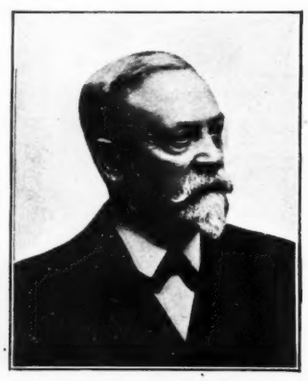
Obituary

J. D. Peters, of Carbondale, Ill., a few years ago general manager of the Chicago & Carterville Coal Co., with mines at Herrin, Ill., died in a hospital in New York City, where he had been for about five months. He was one of the pioneers in the southern Illinois fields. Born in Ohio, he drifted to Illinois and was with a coke and foundry firm at Grand Tower when the Big Muddy field was at its height. He later helped build the railroads that cover southern Illinois, and about 25 years ago began as an operator in the Carterville field. He retired a few years ago on account of ill health. He was a veteran of the Civil War and leaves a wife and grown family.

James E. Roderick, Chief of the Department of Mines of Pennsylvania for the last 20 years, died at his home in Hazleton, at 6 a.m., Feb. 4, from bronchial trouble, which became acute, due to a severe cold contracted on Jan. 20, at Okmulgee, Okla., where Mr. Roderick had gone for a few days to look after some personal interests in the oil fields.

Mr. Roderick was born in South Wales, January, 1842. He attended school until the death of his father, when, at the age of 13 years, he entered the mines. He continued his studies, however, attending night school until he came to this country, in the early sixties. Mr. Roderick then located, first at Pittston, Luzerne County, where he was engaged as a miner's laborer. Afterward he worked as a miner, doing all kinds of labor in the mines around Pittston and Wilkes-Barre, until Jan. 1, 1866, when he was appointed mine foreman of the Empire shaft, operated then by the Wilkes-Barre Coal and Iron Company.

On the first day of June, 1870, he resigned that position to accept the superintendency of coal mines for the Warrior Run Mining Co. In July, 1881, he went before the board appointed to examine applicants for the position of mine inspector; and,



JAMES E. RODERICK

having answered over 90 per cent. of the questions asked, he was appointed inspector of mines, with headquarters at Hazleton. He served as mine inspector until June 1, 1889, when he resigned that position to become the general superintendent of the coal interests of Linderman & Skeer. At the expiration of the lease of Linderman & Skeer, June 1, 1896, Mr. Roderick became general superintendent and manager for A. S. Van Wickle's extensive coal interests.

Mr. Van Wickle, having died, Mr. Roderick resigned his position June 1, 1899, to accept the appointment to the office of Chief of Bureau of Mines, under Governor Stone. He served in that position until Apr. 15, 1903, when he was appointed by Governor Pennypacker, as chief of the newly established Department of Mines, for a term of four years. In 1907, he was reappointed by Governor Stuart for a third term of four years, and, in 1911, was reappointed by Governor Tener for a fourth term of four years. In 1916, Mr. Roderick was reappointed by Governor Brumbaugh for a further term of four years.

Mr. Roderick was chairman of the Commission which drew up the bituminous code in 1911 and was chairman of the subcommittee appointed to draw up a new code for anthracite mines in 1913, but which was defeated in the Legislature.

Since July, 1881, he has lived in Hazleton, where he was a member of the First Presbyterian Church, a director of the First National Bank and President of the Middle Coal Field State Hospital. He has served as a school director, and as select councilman.

Mr. Roderick is survived by his widow and three children: Edward R., a prominent physician, James E., Jr., an attorney-at-law, and Mrs. Nellie E. Jones, all of Wilkes-Barre.

New Patents

Keeper for Mine Cars. A. W. Spaht and G. R. Jacobs, Christopher, Ill., 1,249,231. Dec. 4, 1917. Filed Aug. 9, 1917. Serial No. 185,389.

Coal Producing and Byproduct Recovering Method. M. Marshall, Port Coquitlam, British Columbia, 1,248,883. Dec. 4, 1917. Filed Aug. 14, 1917. Serial No. 186,211.

Furnace. D. S. Jacobus, assignor to Babcock & Wilcox Co., Bayonne, N. J., 1,248,661. Dec. 4, 1917. Filed June 30, 1914. Serial No. 848,139.

Dump Car. H. R. Keithley, Michigan City, Ind., 1,248,666. Dec. 4, 1917. Filed Apr. 23, 1917. Serial No. 163,956.

Coaling Tank or Hopper. V. Z. Caracristi, Bronxville, N. Y., 1,248,610. Dec. 4, 1917. Filed June 2, 1916. Serial No. 101,315.

Automatic Stoker. B. V. Edwards, Newark, N. J., 1,249,048. Dec. 4, 1917. Filed Jan. 17, 1916. Serial No. 72,397.

Combined Coal and Gas Water Heater. H. A. Becker and A. D. Dukelow, assignors to Sill Stove Works, Rochester, N. Y., 1,248,793. Dec. 4, 1917. Filed Nov. 10, 1916. Serial No. 130,538.

Mining Machine. C. A. Pratt, assignor to Goodman Manufacturing Co., Chicago, Ill., 1,249,823. Dec. 11, 1917. Filed Oct. 31, 1910. Serial No. 589,836.

Apparatus for Lifting Furnace Doors. S. Dillon, Edgewood, Penn., 1,249,605. Dec. 11, 1917. Filed Apr. 15, 1914. Serial No. 832,402.

Grate for Furnaces. A. W. Finlayson, Detroit, Mich., 1,249,365. Dec. 11, 1917. Filed May 22, 1916. Serial No. 99,034.

Coal Gas, Manufacture of. A. Waddell, Dumfermline, Scotland, 1,249,864. Dec. 11, 1917. Filed Feb. 29, 1916. Serial No. 81,108.

Mining Machine. E. L. Hopkins, assignor to Jeffrey Manufacturing Co., Columbus, Ohio, 1,249,400. Dec. 11, 1917. Filed Sept. 9, 1913. Serial No. 788,853.

Chain for Mining Machines. C. E. Davis, assignor to Goodman Manufacturing Co., Chicago, Ill., 1,249,904. Dec. 11, 1917. Filed Sept. 9, 1913. Serial No. 788,853.

Safety Supporting Device for Mine Cages. G. H. Schofield, Leigh, Eng., 1,253,633. Jan. 15, 1918. Filed Apr. 11, 1917. Serial No. 161,330.

Trade Catalogs

"'Rimco' Rubber Insulated Pliers." Rubber Insulated Metals Corporation, Plainfield, N. J. Folder. Pp. 4; 3¼ x 6¼ in.; illustrated. Describes a rubber insulated plier that has been tested and passed for 10,000 volts. Insulation will not crack or break when dropped on a hard surface or from the arm of a pole.

"C-H Electric Air Heaters." The Cutler-Hammer Manufacturing Co., Milwaukee, Wis. Folder. Pp. 6; 3¼ x 6 in.; illustrated. The heaters described are divided into a number of groups, several being for industrial or mill use, and are made in capacities of from 2 to 10 kw. Other heaters desirable for offices, bedrooms, bathrooms, etc., are also shown, and the dimensions, ratings and prices given.

"C-H Electric Space Heater Unit." The Cutler-Hammer Manufacturing Co., Milwaukee, Wis. Folder. Pp. 6; 3¼ x 6 in.; illustrated. Describes a steel-jacketed unit which is approximately the size of a 2-ft rule. A number of applications of this unit are also described and several ways of mounting are suggested. These units are put up in standard packages of 10 units each. Capacity of each unit is 500 watts and they may be used on either alternating or direct current circuits.

Publications Received

Methods for Increasing the Recovery from Oil Sands. By J. O. Lewis. Department of the Interior, Bureau of Mines. Bulletin 148, Petroleum Technology 37. Illustrated, 120 pp., 6 x 9 in.

Abstracts of Current Decisions on Mines and Mining, Reported from May to August, 1917. By J. W. Thompson. Department of the Interior, Bureau of Mines. Bulletin 159, Law Serial 12. Unillustrated, 110 pp., 6 x 9 in.

Gypsum Products, Their Preparation and Uses. By R. W. Stone, Geologist, U. S. Geological Survey. Department of the Interior, Bureau of Mines. Technical Paper 155. Mineral Technology 19. Illustrated, 61 pp., 6 x 9 in.

Compressibility of Natural Gas and Its Constituents, with Analyses of Natural Gas from 31 Cities in the United States. By G. A. Burrell and I. W. Robertson. Technical Paper 158, Petroleum Technology No. 42. Illustrated, 14 pp., 6 x 9 in.

Industrial News

St. Louis, Mo.—Since the municipal coal stations opened Dec. 7, they have sold 2571 tons, or approximately 64 cars. The revenue to Feb. 1 was $10,283.89.

Albany, N. Y.—The Albany Clay Products and Crucible Coal Co., Inc., has filed notice with the Public Service Commission of an increase in its capitalization from $1500 to $10,000 to provide for expansion.

Frankfort, Ky.—A bill has been introduced in the Kentucky Legislature, now in session, which would permit coal companies and manufacturing plants to operate on Sundays during the war.

Memphis, Tenn.—Local coal consumers have been advised on various occasions recently by coal shippers that the reason for failure of coal to arrive has been that the railroads took most of the output.

Chicago, Ill.—The Wolff Coal Saver Co. has filed notice with the Public Service Commission of an amendment to its charter increasing its capital from $2,250,000 to $2,700,000 to provide for extensions, etc.

Nicholasville, Ky.—On account of the difficulties in the way of obtaining coal, the municipal light and power plant of Nicholasville has gone on a reduced period schedule and is operating only from 5 to 11 P.M.

Dover, Del.—The Coxe Stoker Sales Co. has been incorporated here with a capital of $60,950, to manufacture stokers and fire grates. The incorporators are William Lloyd, G. W. Wilmot and L. O. Emmerlich, of Hazleton, Penn.

Plymouth, Penn.—Several hundred employees in the Powell Squib factory have been granted an increase in wages from 10 to 25 per cent. A strike was threatened at this plant, but the offer of the Federal mediation board was accepted.

Shawnee, Ohio—The White Oak Coal Co. has been incorporated with a capital of $4000 to mine and sell coal. The incorporators are W. E. White, Theodore Schubert, Roy White, Frank White, Charles E. White and William G. Bartrow.

Sutton, W. Va.—The Pittsburg Summit Coal Co., which recently increased its capital from $25,000 to $75,000 for expansion, is planning for the immediate development of 98 acres of coal lands, to have a capacity of 250 tons daily. C. C. Davis is president.

Knoxville, Tenn.—The Knoxville Gas Co. is circulating petitions among its customers, asking them to agree to an increase of 20c. on the 1000 cu.ft. The rate is now $1. Increased coal costs and increased labor costs are set forth as the reason for the advance.

New York, N. Y.—J. D. Barnhill, Inc., of 110 W. 34th St., advertising and service agency, announces a change of officers, as follows: Philip S. Dodd, president; Clayton Du Bosque, vice president and treasurer; William T. Andrews, secretary and art director.

Chillicothe, Ohio—As a carload of coal was being dumped for use at Camp Sherman, 18 sticks of dynamite were discovered in the car. Opinion is divided as to whether it was in an attempt on the part of pro-Germans to blow up the camp or the result of carelessness.

Marion, Ill.—The St. Louis Coal Co. has taken over the shaft on the Goddard farm northeast of here and is sinking an air shaft and getting ready to develop and operate this property as fast as materials can be secured. It will have a capacity of 3000 tons per day.

Jackson, Ky.—The Breathitt Coal Fields Exchange, with capital of $10,000, has been organized and will buy coal from operators and sell in the market, operating under Government price regulations. H. C. Musick, of Jackson, is interested. E. B. Cardwell is manager.

Berryburg, W. Va.—The Berryburg Coal Co. is having plans prepared for the construction of 42 two-story miners' residences, about 26 x 30 ft., as the initial work on 60 residences to be built ultimately. A. B. Crichton, Farmers Trust Building, Johnstown, Penn., is engineer.

Columbus, Ohio—John J. Roberts, 1177 Leonard Ave., fell into the hands of police on a charge of having sold coal by short weight. The arrest was made on an affidavit sworn to by Edgar Watts, Shepard, who alleges Roberts sold him 530 lb. of coal for a half ton—1000 pounds.

New Baden, Ill.—There is no immediate prospect of the reopening of the New Baden mine here of the Southern Coal, Coke and Mining Co., of St. Louis, the main shaft of which has been caved in for the last couple of months. This means a loss of between 2000 to 3000 tons of coal per day.

Allentown, Penn.—Engineering and Auditing department of the Harwood Electric Co. will be removed to this city, which will mean that about 15 of the employees of the company will be transferred from Hazleton. Only the field corps of the engineering department will remain at Hazleton.

Cleveland, Ohio—Fifteen cents a ton increase in coal prices was allowed to the retailers by the local fuel committee. This advance to the consumer, however, is only for the month of February. A committee of the retail merchants presented a request to the committee for a 42c. raise on each ton sold.

Marysville, Ohio—A 50-ton carload of coal shipped here and consigned to the Marysville Board of Education for the West School Building was seized by the local fuel administrator and distributed to homes in half-ton lots, where families were entirely out of coal, through the coal clearing house.

Logan, Ohio—The Spencer-Hollow Coal Co. has leased from the Buckeye Coal & Railway Co. 300 acres, located on the Hocking Valley, upon which a 600-ton mine will be opened shortly. No. 7 vein will be mined at that place. Electrical power will be secured from the Hocking Power Co., at Floodwood.

Marion, Ohio — George Whysall, county fuel administrator of Marion County, has issued an order for all coal cellars and bins to be inspected. He claims that there is sufficient coal in cellars to supply all domestic and steam users for more than a week. It is planned to distribute all surplus coal so hoarded.

Perth Amboy, N. J.—New York Harbor police and Government employees began the task, Jan. 29, in coöperation with the owners, of raising 11 coal barges sunk by the ice during the recent cold wave, in Staten Island Sound. The barges, containing a total of 40,000 tons of coal, are blocking the channel.

St. Charles, Ky.—The C. M. Riker Coal Co., Paducah, has completed all organization plans, and is planning for the early development of about 972 acres of coal lands to have a capacity of from 750 to 1000 tons daily. The company is planning for the immediate installation of air compressor and cutting machines. C. M. Riker is president.

Stockton, Penn.—Announcement was made Jan. 29 by officials of the Bethlehem Steel Co. that the entire East End department, including the frog and switch department and bridge shop, would be closed because of the lack of fuel. Approximately 1000 men were thrown out of work. Coal is enroute to the plant, but the storms tied up traffic.

Columbus, Ohio—Robert Lake, president of the Michigan-Ohio-Indiana Coal Association, who resides at Jackson, Mich., was in Columbus last week in conference with B. F. Nigh, secretary of the association, relative to the mid-winter meeting of the directors. The meeting will be held some time during February, the exact date to be announced later.

Columbus, Ohio—Plans for handling the municipal coal yard, recently authorized by the city council, has been announced by city officials. Each of the fire-engine houses in the city will be made a retail point where coal is to be sold to consumers at the rate of 30c. per bushel. The limit to be sold to each customer is two bushels. Customers must come after the coal.

Orient, Ohio—The Orient Coal Co., recently organized at Columbus with a capital of $25,000, has taken over the working coal mine of William Crowe, located in Vinton County on the Hocking Valley, which will be enlarged by the installation of electrical equipment. There are 80 acres in the property. The present capacity is 50 tons daily, which will be increased to 300 tons. George W. Moss is president and E. H. Alton secretary and treasurer.

St. Louis, Mo.—Fuel Administrator Crossley has announced that within a few days, unless there is a decided change for the worse in weather conditions, the early closing order, under which nearly all branches of business have been closed at 7 p.m., will be rescinded. The rescinding of the order will not, however, extend to the electric signs and illuminated advertising devices, which will continue dark.

Columbus, Ohio—President Westlake, of the Columbus City Council, has offered a resolution calling on Homer H. Johnson, Ohio Fuel Administrator, to investigate the alleged action of certain railroads entering Columbus in permitting miles of coal cars filled with slag to stand on sidetracks while Columbus is suffering from lack of fuel. Mr. Westlake claims that he counted 300 cars on the Hocking Valley Ry. so loaded.

Nelsonville, Ohio—The Keystone Coal Co., of Nelsonville, has leased from the Buckeye Coal & Railway Co. a large acreage which will result in two new mines. The company will build two miles of railroad to connect with the Hocking Valley. The property is located in York township, and it is planned to have each mine produce 100 tons daily. No. 6 vein, which is 6 ft. thick, will be mined.

Paducah, Ky.—C. M. Riker, general manager of the Carbondale Coal and Coke Co., of St. Charles, Ky., and of the Eureka Coal and Coke Co., of Paducah, Ky., has purchased a tract of coal and timber land, embracing 972 acres, near Hamby, Ky., and has incorporated the C. M. Riker Coal Co. to develop it. Borings show deposits of 11,000,000 tons, and Mr. Riker proposed a development to produce 1000 tons daily in the near future.

Nelsonville, Ohio—The North Hocking Coal Co. has leased from the Buckeye Coal & Railway Co., of Columbus, 320 acres in Trimball township, Athens County, located on the Hocking Valley. An opening will be made just north of Murray City and a mine with a capacity of 600 to 700 tons daily will be opened soon. A modern tipple will be erected. The mine taps the No. 4 vein, which is 4 ft. 6 in. thick.

Columbus, Ohio—A feature of "Farmers' Week" at Ohio State University was coal conservation demonstrations by E. A. Frothingham, of the United States Forest Service, who came to instruct woodland owners in the best methods by which firewood can be "harvested." It is hoped to interest farmers in the project of woodyards, where not only fuel from woodlands, but refuse from sawmills and woodworking plants may be utilized as fuel.

Tulsa, Okla.—Opening of virgin coal lands in Tulsa and adjoining counties is urged by the Tulsa County Council of National Defense as a means of meeting the situation growing out of the coal shortage. Several thousand acres of rich coal lands lie undeveloped in Tulsa County, the coal veins being near the surface and easily mined. Several new coal mines have been opened recently, but still the possibilities of the county as a coal producer have not been touched.

Columbus, Ohio—Chief Inspector Dugan, of the Public Utilities Commission, claims that there are now 12,000 loaded coal cars on Ohio roads awaiting movement, a big per cent. consigned to points outside the state. It is estimated that this would furnish a ton to each of the 600,000 homes in Ohio. Administrator Johnson is making an effort to secure from Washington an understanding as to just how far his authority extends in confiscating this idle coal for the needy Ohio consumers.

Woodlawn, Penn.—Owing to lack of fuel several of the departments of the Jones & Laughlin Steel Co., the largest steel plant in the Ohio Valley, have been closed for several days. Officials of the company were of the opinion that it would be possible to obtain shipments of coal by river with the ice cleared from the Ohio. Only limited rail shipments of fuel have been received by the company for several weeks. As a result of the shutdown it is declared that several thousand men are idle.

Morgantown, W. Va.—The holdings of the Empire Coal Co., controlled by the Elkins estate, and consisting of 4000 acres of coal in the Grant district, Monongahela County, and the Pawpaw district, Marion County, W. Va., have been purchased by the New England Fuel and Transportation Co., a subsidiary of the Massachusetts Gas Co., of Boston, for $4,000,000. It is understood that the company intends to break up the tract by selling parts of it to other companies, with a view to securing as extensive a development of the land as possible without delay.

Harrisburg, Penn.—The Gamble Fuel Briquette Co. has given a lease to the Gamble Briquette Co. to operate its plant. The deal was closed by Hord & Co., of New York, and represents an investment of $75,000. Those interested in the deal are Israel H. Supplee and C. B. Johnston, of Wheeling, W. Va., both of whom have had wide experience in the fuel business. The new company intends to commence operating within about two weeks. The company will be under the management of the most expert briquetters in the country and expects within a short time to turn out 100 tons of briquettes a day.

Louisville, Ky.—The city's fuel difficulties have been increased by the washing out of one of the three feed lines leading to the compressor station of the Louisville Gas and Electric Co., whence the gas is directed into the main 180-mile pipe line. This has reduced still further an already inadequate supply of natural gas for the city and has increased the demand for coal. The last of January saw a total of 70 per cent. penalty discount against the bills of the company to its domestic consumers, making a total discount of 110 per cent. for the two months, or an average of 55 per cent. a month.

Birmingham, Ala.—The following coal companies have filed articles of incorporation in the office of Probate Court of Jefferson County: Atlas Coal Co., with a capital stock of $100,000, will develop properties in Walker County, near Dora, Ala. The officers of the company are G. H. Garmany, president; B. M. Hobson, vice president; J. C. Grant, secretary-treasurer. Head offices will be in Birmingham. Green River Coal Co., of Birmingham and Sebree, Ky., capital stock $10,000. N. O. Tyler, of Birmingham, is president; Ernest V. Moore, of Atlanta, vice president, and J. M. Anderson, of Birmingham, secretary. Ida H. Taylor is one of the incorporators.

Sunbury, Penn.—Record of a deed of trust for 22 parcels of land bordering on and in some cases reaching to the center of Shamokin and Mahanoy Creek, in Northumberland and Schuylkill Counties, made on Feb. 1, show what is apparently a plan to reclaim and sell coal that has been turned into these streams from the mines in the Shamokin district on a large scale. The deed shows that the property was secured by purchase or option at a total cost of almost $100,000 by a corporation known as the Eastern Coal Co. It is made in favor of Edwin S. Meade, of Doylestown, Penn.; Charles J. Farrell, of Mt. Vernon, N. Y., and Donald C. Mulman, East Orange, N. J., and the Central Trust Co. of New York is the grantor.

St. Louis, Mo.—The question whether the Illinois Fuel Administration or the Missouri Fuel Administration shall control the Illinois coal field adjacent to St. Louis has been brought to a head by a protest sent to Administrator Garfield by Administrator Williams, of Chicago, against diversion by the St. Louis Fuel Committee of coal requested by Gen. William H. Bixby, Chairman of the Mississippi River Commission, for coaling Government boats in an effort to save barges containing $3,000,000 worth of Government supplies, carried away by the ice at Memphis. The protest was made in spite of the fact that the St. Louis committee obtained the assent of one of Administrator Williams' assistants before ordering the diversion. Missouri Administrator Crossley has asked Administrator Garfield for an early decision on the question of control, which he has under advisement. The contention of the Missouri administration is that the Fifth and Ninth Illinois districts are operated from St. Louis and are the natural supply for Missouri and that the output should be assigned to the Missouri Administration.

Cincinnati, Ohio—The Monongahela Consolidated Coal and Coke Co.'s towboat "Charles Brown," with a number of barges, was sunk in the recent ice jam in the Ohio River, causing a loss of $60,000; the entire fleet of the Campbell's Creek Coal Co., at Ludlow, Ky., just across the river from Cincinnati, consisting of 40 empty barges, two fuel flats and a pumpboat, was lost, with damage of about $40,000; the Hatfield Coal Co.'s towboat "Rebe Reeves" was sunk, a loss of $15,000; the Marmet-Halm Coal and Coke Co.'s fleet at North Bend, Ind., near Cincinnati, 12 barges, was carried down the river and probably lost, with danger of further losses to the company's vessels; the towboat "Hattie Brown," with 20 barges, was caught in the ice and badly damaged. Besides these losses at Cincinnati, many barges carried down from unknown points up the river, loaded with coal, were observed floating down, some of them being crushed against bridge piers and sunk. The total damage done by the sudden breaking of the freeze-up and the movement of the ice has been estimated at $3,000,000.

MARKET DEPARTMENT

GENERAL REVIEW

The country again approaches a coal crisis. This is occasioned by inadequate motive power and bad weather conditions.

Again the "Weather Man" appears to evince a friendly spirit toward the Kaiser. The cold wave which descended upon the country the first part of the week was in many instances, with one or two exceptions, the coldest weather which had been encountered for years. This, of course, greatly interfered with railroad transportation and undid in large measure the good work which had been accomplished up to that time. Throughout New England the fuel situation is acute, both as regards manufacturing and domestic consumption. A short temporary priority order secured at Hampton Roads in favor of this territory helped to a certain extent. Railroads in many instances have but a scant supply of fuel, and in a few cases are enabled to operate only through the coöperation of connecting lines. In New York City and vicinity, due largely to adverse weather conditions, coal is extremely difficult to obtain, and practically no stocks are on hand, particularly in the yards of retail dealers. The severe weather has greatly hampered the dumping of cars at the various terminals on the Jersey shore. In Philadelphia receipts are by no means equalling requirements, and quite a quantity of bituminous coal has been commandeered and turned over to the retail trade for distribution. The people receiving this coal, not being accustomed to its use, are having their troubles, but these are doubtless less severe than would be occasioned if no coal could be had. Efforts to secure river coal at Pittsburgh were temporarily successful, and it was thought that a large part of the city's difficulties had been surmounted, when a new cold wave struck that region and undid the work which had been accomplished in the shape of opening the lower pools of the Monongahela. The warm weather which had preceded the cold wave had, however, loosened up the car situation to a considerable extent and car supplies the first day or two of this week were better than formerly. The coal trade in the Middle West is still operating under great difficulties imposed by the excessive snow-fall in the past few weeks. Traffic conditions are extremely bad, and mine operation is likewise. From all over the country come reports of industries cleaning their bins of fuel, and in many cases being down to bare boards. Certain plants have been forced to shut down, while others are only able to keep running on a hand-to-mouth basis through special orders of the local fuel administrators. The domestic situation is scarcely less serious, and the suffering in many homes is intense. It is not believed that these conditions will permanently and entirely right themselves until warmer weather has relieved the adverse conditions under which the transportation of the country is now laboring.

A Year Ago—Anthracite quiet but prices continue firm. Foreign complications upset the bituminous market at tidewater. Movement slow and supplies very short at some interior points. Shortage very acute in some sections of the Middle West.

BUSINESS OPINIONS

The Iron Age—The pig-iron statistics for January give a measure of what the steel industry has suffered from the unparalled weather and transportation conditions of the past month. Output fell to 2,411,768 tons, or 77,799 tons a day, against 2,882,918 tons in December, or 92,997 tons a day. January production was thus the smallest since May, 1915.

Bradstreets—Business in an industrial as well as a commercial sense is hobbled, either because of scarcity of goods, enforced weekly shut-downs, adverse weather conditions, paucity of fuel, insufficient production, or freight congestion, and after seven weeks of cold, stormy weather little headway has been made in working out of blockades

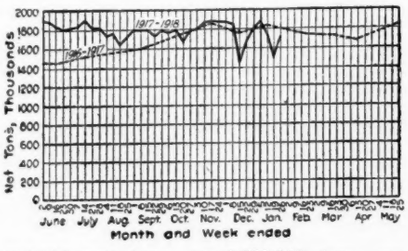
The Dry Goods Economist—Freight congestion continues to be the order of the day, efforts to relieve the situation having been largely nullified by the latest snowstorms. To the retailer this means delays in the delivery of goods needed for early spring selling, while to the manufacturer it carriers a threat of idle plants through lack of fuel and raw materials.

The American Wool and Cotton Reporter—The cotton goods market appears stronger than it has been. The relative supply of goods available for ordinary distribution is becoming smaller, the cost of production is increasing and the influence of supply and demand more apparent than it has been up to the present.

Marshall Field & Co.—The current wholesale distribution of dry goods is ahead of the heavy volume of the corresponding period a year ago. The volume of road sales for both immediate and future delivery is considerably larger than in the same week of 1917. Customers have been in to market in about the normal number. The market on domestic cotton continues strong. Collections are fully as good as a year ago.

COAL PRODUCTION

A recovery from the depression of the week before left production during the week of Jan. 26 still far short of normal. The weather was cold but the snow falling over most of the fields was not heavy enough further to impede transportation. The total bituminous production (including lignite and coal made into coke) was 10,018,000 net tons, or 1,670,000 tons per working day. The rate approximates that of a fortnight ago during the first week of the depression, when the daily average was 1,689,000 tons. The production of beehive coke did not share in the recovery made by the bituminous industry as a whole. The total production for the week ended Jan. 26 is estimated at 491,000 net tons, an average per working day of 82,000 tons. The estimated rate of production subject, of course, to revision, is the lowest recorded since these bulletins were begun.



Shipments of anthracite by the nine principal carriers amounted to 33,406 cars, as compared with 31,861 cars during the preceding week.

CARLOADS OF COAL AND COKE ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS WEEK ENDED:

	Jan. 5	Jan. 12	Jan. 19	Jan. 26
Bituminous shipments, 121 roads.	168,936	180,411	130,865*	180,362†
Anthracite shipments, 9 roads....	25,604	36,178	31,861*	33,406†
Beehive coke shipments, 4 roads....	9,348	11,560	10,826*	10,078†

* Revised from last report. † Subject to revision.

Atlantic Seaboard

BOSTON

Slender stocks on hand in cities doled out under supervision of fuel committees, although rules are relaxed to include plants working on war orders that have license to operate on Monday holidays. Factories continue to close down, but in many cases emergency supplies are found and industrials have not yet ceased to the extent that was feared. New England in a precarious state. Railroads in certain cases are next door to fuel starvation and only through special provision by connecting lines are enabled to operate. Priority for New England cargoes secured at Hampton Roads for 72 hours. Anthracite receipts so light as to be negligible.

Bituminous—From present appearances "fuel tickets" are a possibility in the near future, especially in the cities. In Boston, Portland, Providence and other New England centers, deliveries of coal, except for governmental purposes, for public utilities, dwellings, and other uses on the preferred list, have been discontinued for more or less indefinite periods. The time originally prescribed in Boston was 48 hours, but this has since been extended 12 hours, and probably will be extended again. A large number of office buildings are heatless and elevator-less; others are made so after 10 A.M. The restrictions are being carefully observed and people generally show a remarkably fine spirit of coöperation. Their anxiety usually is to find out exactly what is prescribed.

In view of the marked decrease in output for January, and the unprecedented conditions at the loading ports there is no chance of decided improvement for weeks to come. At Hampton Roads an ice storm followed three weeks of the worst weather in the history of the piers. The latter, together with the coal in cars, were covered with ice and early in the week dumping was extremely slow. A day of rain helped in handling coal and more ships were cleared on Jan. 31 and Feb. 1 than in any similar period for several weeks. Car movement showed no improvement, however, and at the end of January the total of coal cars in transit was less than half normal.

These are some of the conditions that lead the fuel authorities to scrutinize every application for coal, whether from railroads or householders. The rules for observing preference fall hard in a great many cases and it is difficult to deal equitably with them all. Plants that are classed as "unessential" are often the only industries in towns where a large population is dependent and where there is no supply of fuel to distribute. There are colleges whose bins are fast getting down to bare boards, and the extent not only of inconvenience, but of actual privation, will soon be immeasurable. There are indignant protests at alleged "hoarding" by railroads and other utilities, but there is also less complaint of unfairness in distribution than might have been looked for. The public is learning to what extent the coal they get is dependent upon the operation of railroads and that the "stocking-up" of 20 to 30 days' reserve is only a necessary precaution. A pile of coal seems enormous until it is realized what a great utility requires, even on a daily basis, and that the movement of coal at all is largely dependent upon the effective operation of railroads.

Through emergency cargoes and the limited shipment of coal all-rail on the New England order the hospitals and pumping stations are gradually accumulating 30-day reserves, and already the Fuel Administration is allowing "Storrow" coal to reach munition plants and other industrials that are working 100 per cent. on Government orders. For a time only the most important, even on this classification, can be considered, but it is hoped that shipments in better volume from the various loading ports will increase the supply through the usual channels. Ice in Long Island and Vineyard Sounds still interferes with shipping and is only one of the difficulties that have arisen from the prolonged cold weather.

The Panama Railroad transport "Achilles" is secured for a fourth trip and helped a little to relieve the gloom that had settled upon industrial circles when it was feared no other ships were in prospect to help satisfy some urgent demands. A large part of the third cargo was forwarded for distribution through retail coal dealers for domestic use. A large number of communities are destitute of either hard or soft coal and even a relatively small supply of the latter is a godsend. Such shipments have gone forward as far as Rockland, Maine, and St. Johnsbury, Vt., while points 100 mi. nearer the mines from Boston were sent small shipments to tide them over for a few days. Notwithstanding such measures as the loan of the "Achilles" there is little optimism here over the outlook for February and March. Other ships are in line to load emergency cargoes, but in the aggregate, the tonnage is so relatively small that the relief given is extremely limited.

There is confusion, too, over the priority

in which different war industries should be served, and soon there will be wide-spread dissatisfaction unless a more careful supervision is exercised over distribution. Volunteer workers under the fuel administrators are doing what they can under hard conditions: for the most part they have been swamped with work, and find it difficult to get accurate information as to the really deserving cases. Applications are so apt to be "colored" through individual anxiety that should the present posture of affairs continue some plan of inspection and check will have to be put into operation.

A lot of apprehension is focussed on Feb. 15 so large a number of plants are certain to be bare of fuel by that date, unless something providential, like mild weather, should intervene. How important textile mills that burn coal by the thousands of tons weekly can possibly be kept supplied is a question no one seems able to answer.

The Maine Central R.R. was again within two days of being out of fuel early this week and the only relief in sight was the diversion of a steamer en route from Louisburg, C. B., to the New Haven R.R. at Boston. The southern division of the Central Vermont Ry. was also on the narrowest of fuel margins when relief came at the hands of a retail coal dealer! Scores of trolley and light plants have been in a similar predicament.

J. J. Storrow, New England Fuel Administrator, secured through Washington an order granting priority to bottoms wanting to load for New England, this to continue 72 hours from Jan. 31. On Feb. 1 the order was shown to be effective, and several ships, including a 7200-ton steamer for the Edison plant in Boston, on which the latter was dependent for an arrival by Feb. 4, were cleared. No doubt this order was the means of saving the situation in many instances. The difficulty is that all the emergency means thus far put through are only temporary and as such they may simply postpone what many are calling "the inevitable."

NEW YORK

Local conditions remain serious. Receipts are small, while demand continues heavy. Retail dealers establish zoning system. Bunker situation nearly normal but free coals are scarce. Storms impede deliveries. Too much coal going to Canada.

Anthracite—There has been no improvement in the anthracite situation. Supplies are no more plentiful although a few days of higher temperatures helped to alleviate conditions. The demand continues to be as heavy as at any time since the shortage of coal became acute and there are dealers who have practically retired from business so far as making deliveries are concerned. Any improvement that might have resulted as a result of warmer weather was dispelled by a sudden wave of low temperatures which rapidly extinguished any bright hopes that might have existed.

The pooling of anthracite at the various terminals which is now general, has aided the situation insofar as quicker deliveries go, but receipts have not been sufficient to overcome the shortage which is growing daily, now that the reserve stocks in the household bins are being gradually wiped out.

The saving of fuel accomplished as a result of Dr. Garfield's order for a coalless Monday has been variously estimated at from 15,000 to 20,000 tons but no actual figures are available. The report that Dr. Garfield might cancel all other coalless Mondays did not meet with the entire approval of the Fuel Administration officials here, it being contended that the situation did not warrant the rescinding of the order. It was said that not enough coal was coming into the city to supply all demands and that conservation must continue in order to prevent a greater closing down of business.

Local Administration officials attended a conference called by Dr. Garfield in Washington on Monday of this week at which the proposal to cancel all other coalless Mondays was to be considered.

A statement issued by C. E. Robertson, deputy state fuel administrator, calling attention to the shipments of coal to Canada attracted considerable attention. Mr. Robertson said that the seriousness of the anthracite situation in Greater New York and New York state has been aggravated by a wretched distribution of coal made by some shippers and some producers to retail coal dealers. After stating that anthracite production in 1917 increased 15 per cent. over that of 1916, Mr. Robertson says the dealers in Manhattan and the Bronx should have received several hundred thousand tons more than they did for the year 1917, while the reports of the County Administrators for Brooklyn, Queens, Richmond and Long Island show that these places did not even receive the tonnage for the year 1917 which was delivered in 1916. He then shows by figures furnished by the Department of Commerce that in the year 1916, from Jan. 1 to Dec. 1, there was delivered by shippers to Canada 3,776,427 tons; while in the same period of 1917 there was delivered 47,575,824 tons, an increase of 991,397 tons, or 26¼ per cent.

In calling attention to these figures Mr. Robertson says:

"As an instance of the flagrant violation of the law of equity and fair distribution, I will cite the case of the anthracite shipments of coal to Canada. No one wishes to deny Canada her proportionate supply of coal. We are willing to endure with her the sacrifices and sufferings occasioned by war, but we feel she has received a larger increased tonnage than she is justly entitled to, caused by the discrimination of some shippers of coal."

Mr. Robertson also says:

"When we bear in mind there has been an increase in the general anthracite production of only 15 per cent. we know that shippers have delivered to Canada 11¼ per cent. more than they should. In other words, an over-delivery of approximately 425,000 tons."

Efforts to provide for a better distribution of coal among consumers are under way following a conference between the local retail dealers and a representative of County Fuel Administrator Schley. It is intended to divide Manhattan and the Bronx into zones under the direction of a committee consisting of M. F. Burns, Thomas F. Farrell and George Eltz. It is proposed that where a dealer who has all his customers in what is known as Class One which consists of apartments and private houses, supplied, that whatever surplus coal he may have left over shall be pooled, if necessary, to supply the customers of another dealer or dealers who may not have been as fortunate in taking care of their customers. The coal shortage in apartment houses is causing much worry, it being estimated that there are between 400 and 500 such places in Manhattan and the Bronx without fuel.

Retail dealers complain bitterly of the lack of protection afforded them by the police when a boatload of coal is tied up at the unloading docks. Frequently, they say, much of the coal is stolen before the dealer has the time or opportunity to unload the boat. Instead of sending several policemen as is necessary because of the size of the crowd surrounding the boat, one patrolman is sent.

Complaint had been made that certain retail dealers had entered into competion with the peddlers and hucksters, but this trouble has been ended. The Mayor during the week issued an order that coal wagons be given the right of way like ambulances and Fire Department vehicles, in order to make quick deliveries.

It is reported that during the month of January there was received into the Bronx 41,000 tons of anthracite, while 155,000 tons were needed.

Buyers are not now asking for any particular size but are willing to take anything that is black and looks as if it will burn. Dealers are making deliveries in the same way and frequently broken coal is put into a bin instead of one of the smaller sizes, the consumer gladly breaking the chunks into the size he wants. The outcome of the investigation about to be started in the mining regions as to the quality of the coal shipped to market will be closely watched here, numerous complaints having been made as to the quantity of slate and rock received.

Rice and barley are about the only sizes to be picked up quickly.

Current quotations, per gross tons, f.o.b., Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$6.30	$7.05
Egg	6.20	6.95
Stove	6.45	7.20
Chestnut	6.55	7.30
Pea	5.05	5.80
Buck	4.30@5.00	5.50@5.80
Rice	3.75@3.95	4.50@4.80
Barley	3.25@3.50	4.00@4.25
Boiler	3.50@3.75	.....

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—Heavy snowstorms in the mining regions have naturally impeded shipments and the situation is extremely critical. The bunkering situation in this harbor has improved considerably and there are very few above the normal number of vessels here awaiting fuel supplies.

The shortage of fuel and the bad rail transportation, intensified by the weather, has seriously interfered with industrial conditions. Many plants are in a bad way for fuel and some of the corporations supplying power for factories in New Jersey have scarcely more than a couple of days' supply on hand.

The piers are handling the coal just about as quickly as it is received but the receipts are small and uncertain. Much trouble has been had with frozen coal. The roads leading to the mines have been covered with heavy snow and when it has been impossible to induce the mine employees to go out and remove the snow the railroads have found it necessary to take their employees from the railroad shops to do the work.

The question of contracts is being brought forward now that the time for renewal is drawing close. No word has been heard as to what the railroads might do as to obtaining next year's coal supply, and the operators have not made any announcement as to what they might do with regard to renewing their individual contracts.

The appointment of J. P. Cameron, of Altoona, to be the district representative of the Fuel Administration to control distribution in the central Pennsylvania fields under the zone system, was welcomed by the operators and shippers, many of whom are personally acquainted with Mr. Cameron. He will be assisted by John Lloyd, Jr., of Altoona; Harry B. Scott, of Phillipsburg, Penn., and Samuel A. Rinn, of Punxsutawney.

Mine employees are much dissatisfied with the poor car supply and are leaving for other industries where the work is more regular and wages as high if not higher.

In his statement calling attention to the shipments of anthracite coal to Canada, C. E. Robertson, Deputy State fuel Administrator, says that the shipments of bituminous to Canada for the 11 months, Jan. 1 to Dec. 1, 1917, were 14,912,698 tons, as against 11,078,665 tons shipped in the same period of 1916, an increase of 3,834,033 tons.

Representatives of several of the larger independent operators shipping to Port Reading and Port Richmond held a meeting on Tuesday of this week for the purpose of putting into effect the pooling of anthracite coal. A report was received from a committee appointed at a previous meeting to devise a plan for such pooling.

Thomas F. Farrell, of William Farrell & Son, has been chosen by County Fuel Administrator Schley to look after the retail trade as a result of the conference held last Saturday between the retail dealers and Mr. Schley's representative at which time the pooling of coal was discussed, with special reference to providing coal for apartments and domestic consumers.

The situation early this week was extremely serious. Coal supplies were scarce and rail transportation was in bad shape on account of heavy snow storms and the extreme cold weather.

The committee of operators appointed a few weeks ago to work out a plan of distribution for anthracite coal for this year, held a meeting in Philadelphia on Monday of this week. The plan or scheme adopted aims at complete coöperation of all anthracite producers, working through a central organization. The scheme will be in full operation by Apr. 1 it is expected.

PHILADELPHIA

Anthracite continues to be held back by weather. Bituminous coal seized to help family trade. Coal thefts alarm dealers. Retailers hard hit by labor shortage. Yard deliveries growing. Congressmen call on National Administrator. Complaints about culm. Steam sizes sold up. Bituminous situation grows worse. Essential plants on close margin. Soft coal for domestic use. Heavy bunkering, with new regulations.

Anthracite—The operating companies, in conjunction with the railroads, made a concerted effort this week to relieve the acute shortage existing. Plans had been laid to consign approximately 60,000 tons for family use to this market. Heavy shipments were at once gotten under way, but more snow came and in addition another severe spell of cold weather, sending the thermometer below zero. This locked rails and switches, and entirely upset calculations. According to those who made a survey of the situation the only remedy now is to wait for a thaw, and the hopes of the railroads may yet be realized as there are indications that the weather will loosen up.

This week the State Fuel Administration confiscated about 300 tons of bituminous coal, which were turned over to the dealers for domestic fuel. Members of the fuel committee have given assurance that they will, under their orders from Washington, confiscate all soft coal needed to keep the homes of the people warm. All this, of course, depends on the willingness of the people to accept it, which perhaps needs not to be reckoned with so much as their ability to use it.

With the first consignment of this coal to the retail men they adopted the practice of picking out the lumps for the family trade and disposing of the slack for smithing purposes, for which there is a heavy demand. Owing to the heavy seizures of soft coal for the anthracite trade it was reported that in this section of the state over 70 large manufacturing plants were closed for the lack of fuel.

A promise of relief from the critical conditions prevailing here was given by National Fuel Administrator Garfield, following the action of Pennsylvania congressmen this week, when at the urgent request of State Administrator Potter they called upon Dr. Garfield in Washington. Dr. Garfield personally informed the congressmen that the presidents of the largest producing companies fully realize Philadelphia's condition and are making unusual efforts to supply the coal. Their efforts to have the New England priority order cancelled in favor of this city were not successful.

In the meantime there is little change in the conditions of the local coal yards. What coal is received goes out almost as soon as it comes in. The several heavy snowstorms greatly hampered the dealers in the delivery of their small receipts. Motor-trucks became stalled and at no time this winter has labor become so scarce. On this account particularly the practice is growing among the smaller dealers of selling their entire receipts in small lots to buyers who will carry the fuel away themselves.

One unfortunate phase of the situation in the outlying sections is that many dealers being unable to secure enough coal to make the business profitable have gone out of the trade entirely leaving their customers dependent upon dealers from whom they have not purchased heretofore and who are reluctant to serve them while endeavoring to dole out their meager supplies to their regular clientele.

The wholesale thefts of coal from cars on railroad sidings has once more grown to an alarming extent. This pilfering has become a business with many, who peddle the coal by the bucket. Members of the Coal Exchange realizing that some immediate and drastic action must be taken called a special meeting to consider the matter. A committee was appointed, and it called upon the Director of Public Safety, who promised better police protection. Later 32 men were arrested and brought before a magistrate. He listened to many moving but fictitious tales of woe and discharged the whole crowd with a reprimand and threats of punishment for repeated offenses. The retailers still hope that they will be able to secure enough convictions to discourage the practice.

The trade is in a turmoil and the nerves of every one connected with coal seem to be on edge. However, it now begins to look as if the Fuel Administration has adopted a new policy, one that will take advantage of the services of operators and distributors who have had years of close study of their business and have built up efficient organizations. The latest evidence of this new policy is the appointment of John Edmonds, sales manager of Madeira, Hill & Co., as anthracite distributor for Pennsylvania. Mr. Edmonds assumed his new duties this week in a quiet but thorough manner. His ability is indisputable and his requests to the shippers are received with confidence and prompt attention. Improved conditions are expected as a result.

Dealers with water-front yards are much interested in agitation to open the old Schuylkill canal this summer under Government subsidy. A number of congressmen have already taken the matter under consideration. At present the canal is but nominally operated, with only 18 barges in use last summer, while years ago the fleet amounted to as many as 800.

Altogether State Chairman Potter has seized during the past week 14,800 tons of anthracite, which have been turned over to retailers for sale to the domestic trade. Mr. Potter has also again cautioned the coal dealers that they must strictly observe the rule not to sell any anthracite family coal to manufacturing plants, either for heating or steam use.

Large shipments of culm have lately been reaching this market. The market on steam coals is entirely sold up and it is hard to obtain a price even from the individual operators, several of whom say they cannot take any more orders even for culm until they are able to clear up some of the orders on their books.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$5.90	$6.05	Buck	$3.15	$3.75
Egg	4.80	6.00	Rice	2.65	3.65
Stove	5.05	6.35	Boiler	2.45	3.55
Nut	5.15	6.40	Barley	2.15	2.40
Pea	3.75	4.65			

Bituminous—The soft coal situation has grown more critical and the stage is rapidly being reached where only the absolutely essential plants and institutions are receiving any fuel. From many of the mines the bulk of the production is taken for Government orders and railway fuel and in the Pennsylvania region numerous operations have not received any cars for commercial loading for over four weeks or more

The railway lines continue badly congested and the frequent snowstorms have prevented any progress from being made. Nothing but several weeks of moderate weather can help the situation. Public utility plants hereabouts are running on a margin of from a week to ten days and in a number of the outlying sections the local fuel commissions have been compelled to seize coal in transit to prevent an entire shut-down. Most of this seized coal has been taken from stocks that had been stored on sidings by the railroads for engine fuel.

The non-essential manufacturing plants are gradually being eliminated simply because hardly any plants are receiving coal except by direction of the fuel authorities and the natural result is that the fuel is only going to those plants that must be kept going at all hazards. Another feature that is affecting the manufacturing industry is the heavy tonnage recently seized for domestic consumption and distributed to retail coal yards which heretofore have only handled anthracite. The coal is quickly taken by the public, but all sorts of complaints are heard of inability to use it. If the bituminous shippers were not so engrossed at this time in the endeavor to preserve their industry it would be a good time to conduct a campaign of education in the proper use of soft coal for home use.

The various operators' organizations have been holding meetings all week endeavoring to formulate some plan whereby production can be increased and transportation facilitated. Unfortunately some of the newspapers have placed a misconstruction on these meetings, intimating an ulterior purpose on the part of the shippers.

The bunkering of vessels goes on actively under the priority orders which are in effect covering this business. This week a regulation was put in force requiring the masters of all ships bunkering coal to make a declaration at the Custom House of the exact amount of fuel taken on board. The master is also required upon reaching his destination to report to the custom officer, if an American port, or to the American consul in a foreign port, the exact amount of coal used since leaving port. The idea is to hold the vessels down to the exact quantity needed and no more.

As has been frequently stated here the entire situation is dependent upon the car supply. This has really grown worse of late principally due to the extraordinary weather conditions to which the railroads have been subjected. There still continues to be much difference of opinion as to the value of the closing orders of the Fuel Administration, but at this time there appears a likelihood of even more extensive periods of idleness without even official order, unless some way is found to increase the supply of coal coming to this district.

BALTIMORE

Fuelless days and railroad embargoes fail to bring relief needed, and many industries are desperately short of coal and thousands of homes are without fuel.

Bituminous—While it may be stated that there is a slight improvement in the number of arrivals of loaded bituminous cars here, the increase is mainly for tide and bunker loadings that do not reach local consumers, and hundreds of small and large industries are now so desperately short of fuel for even emergency operation that only the closest distribution has prevented many shut-downs. Curtailment of service has been noted in many quarters. A considerable part of the soft coal arriving here for other than ship loading is being diverted for domestic use, as it is now estimated that there are between 20,000 and 25,000 homes in Baltimore entirely out of coal of all kinds.

The average unloadings of soft coal here daily for local use do not run over 75 cars, and frequently drop below 50. This is scarcely a drop in the bucket. Transportation is still badly crippled, and cars marked for the fuel administrator at Brunswick and other points days ago have failed to arrive.

Anthracite—The hard coal situation is sadly mixed. A little better movement is noted, but it is counted a good day when from 25 to 30 cars of anthracite are unloaded here. This against a normal consumption of over 100 cars per day when thousands of bins in homes that are now empty are carrying stocks enough to last until spring.

The turning of hard coal consumers to soft coal, when they can get that commodity, has been the only source of relief which the hard pressed dealer had to offer. The recent jump of 75 cents a ton here under the Fuel Administration schedule hardly created a ripple because there was so little coal to sell. No one seems to worry about price just now; its merely a question of getting coal at any price.

Lake Markets

PITTSBURGH

Cold weather follows improvement in car supplies. No river coal movement now in prospect.

Car supplies at most of the mines showed a slight improvement last week, but there was no particular improvement in the dispatch and receipts at consuming points were about the same as formerly. The movement of byproduct coal continues better than that of other coal, but still is not adequate, the byproduct plants from Pittsburgh to Cleveland operating at about 75 per cent. capacity. The Fuel Administration lays particular stress upon the movement of byproduct coke, on account of the byproducts being used in the manufacture of high explosives.

Sunday saw a remarkable spell of warm weather for a few hours, the thermometer rising above 40 degrees and there was rather good movement in consequence, car supplies for Monday being rather good, but Sunday night the temperature suddenly dropped to the neighborhood of zero and the predictions are for continued cold, so that car supplies for the remainder of the week are likely to be poor.

As a result of strenuous efforts by the river steamboats the ice in the third and fourth pools of the Monongahela was either broken up entirely or a channel was cut through it, so that beginning Monday the fourth pool was able to load coal. The temperature went below zero Monday night, continuing Tuesday and forcing abandonment of effort to maintain the channel in four lower pools of the Monongahela River. No river coal movement is now in prospect until weather moderates somewhat. Rail movement was reduced Tuesday by extreme cold.

Zone representatives are being appointed by the Fuel Administration for the coal districts centering in Pittsburgh, but no definite action of importance has yet been put into practice under the new zone system.

Regular open market transactions continue to be of insignificant proportions, but the volume of coal that technically is sold at the set prices, under various instructions of the Fuel Administration, now amounts to a large tonngae. The set prices remain at $2.20 for slack, $2.45 for mine-run and $2.70 for prepared sizes per net ton at mine, Pittsburgh district, with 15c. additional permitted to be charged in sales made by brokers. Under the circumstances, however, the brokers have scarcely any opportunity to do business.

BUFFALO

Coal about as scarce as formerly, but not now said to be on account of lack of mining. Scarcity of cars and locomotives appears to be the reason. Thus shut downs may cease and efforts be made to hurry cars forward.

Bituminous—As the car situation is now said to be to blame for the scarcity of coal, especially bituminous, the authorities are going to take hold of that phase of the problem, as they should have done at the start and see if something cannot be done from this angle. The shippers all along said that it was cars and not production that was wanting and they now say that the mines are full of coal ready mined, waiting for transportation.

While the temper of the coal shippers is not of the best, it is not proper to say that dissatisfaction has been what it might have been if the orders, so many and vexatious, had led to real disaster. The idea is that we have got off so far better than was expected and with the return of mild weather, which cannot now be far away, the situation ought to right itself slowly. It will be some time before it is normal again.

The Government prices of coal prevail more generally as the weeks proceed and April ought to see everything selling at these figures which are as follows, f.o.b. Buffalo:

	Slack	Lump
Pittsburgh	$3.75	$4.25
Bessemer	3.70	4.20
Allegheny Valley	3.60	4.10

Anthracite—The complaints of no coal are heard everywhere, but it is always a hard matter to say how genuine they are. Men who put coal into cellars are saying that if the authorities knew how much coal they often find there the distribution would be different. In spite of all possible effort to prevent hoarding it goes on and will continue to do so till it is known that the supply is adequate, and that may be some months hence.

The local anthracite prices are now about 40 cents higher than they were last fall, on account of the need of distributing single-ton orders and it is held that the retailers have no reason to complain, especially as the Fuel Administration really sells the coal for the most part and collects the pay for it.

DETROIT

Floods in Ohio further curtail scanty coal movement to Detroit. Lack of coal and oil threatens to force suspension of Detroit City Gas Company.

Bituminous—New curtailment of the inadequate shipments of bituminous coal from Pennsylvania and West Virginia, is to be experienced by Detroit, as a result of the floods along the Ohio river. The assertion is made by some of the jobbers that information received from the south indicates almost no coal is likely to get through for several days and possibly weeks, with the exception of shipments already enroute this side of the flood district and such coal as may be available from some of the Ohio fields.

With the supply already so low that suspension of operation is confronting hundreds of Detroit industrial plants, the new obstacle seems to render the situation almost hopeless. Efforts are being made to increase the movement of coal from Ohio, Illinois and Indiana fields but the available supply is small in proportion to the needs of Detroit and Michigan consumers.

The Detroit fuel administration announces it will confiscate any coal available for the gas company. It is unable to provide oil; and presidents of several railroad lines who have been trying to locate missing oil shipments, have found none near enough to insure prompt delivery.

Should the gas company stop operation, hundreds of manufacturing plants using gas in various processes, including a number manufacturing war supplies would have to close in part or altogether, throwing about 200,000 workers out of employment.

The Detroit Edison Co. is but little better off than the gas company and is daily reducing its scanty reserve of coal.

As regards domestic consumers, the situation is even more gloomy than a week ago. Low temperatures nearly all last week caused heavy home consumption, while receipts were cut off by snow and traffic blockades. Nearly 5000 applications were on the records of the police department Saturday morning. The Fuel Administration was unable to supply needs of these consumers.

Anthracite—Very few cars of anthracite are coming into Detroit. Retail dealers say they are unable to fill orders or form any idea of when they will get coal. Mayor Marx is arranging to have large shipments of wood sent to Detroit from interior points of the state.

COLUMBUS

Continued zero weather has further hindered railroad transportation. This is reflected in bad service for the mining industry. Production is reduced and the demand is exceedingly strong.

What changes have taken place in the coal trade in Ohio during the past week have been for the worse. With low temperatures continuing and with railroad congestion and traffic conditions as bad as at any previous time, coal has been distributed with difficulty. Some cases of actual suffering have been reported, although they are not as numerous as might be expected. Taking it all in all, the conditions are quite strenuous and there is little hope of immediate improvement.

Domestic trade has been attracting more attention than any other branch of the business. The county and state fuel administrations have been devoting their efforts to relieve the suffering of the householder. As a result, considerable coal, consigned to steam users, has been diverted to domestic consumers. This is especially true of school coal, which has been diverted and schools have been closed. Hospitals and charitable institutions are fairly well supplied for the time being. Domestic prices are firm at the levels which have maintained for some time. Pocahontas is quite scarce because a large proportion of the production is going East. Anthracite is also practically out of the local market.

The steam trade is strong in every way. The efforts of purchasing agents are now devoted to getting coal to keep the plants in operation. In some instances, outside of fuelless days ordered by the Federal Fuel Administration, manufacturing plants have been able to keep up production. Others have been forced to curtail their activities because of fuel shortage. Public utilities have been the hardest hit and have been often without sufficient fuel. The efforts of the fuel administrators have been devoted to getting coal for various utilities upon which the activities of certain communities depend.

CINCINNATI

Scarcity of coal for all purposes is pronounced. Transportation conditions have never been more difficult, and the weather remains unfavorable.

Such change in conditions as has occurred during the past week has been for the worse, if anything, although there has been some movement of coal toward the North which has tended slightly to reduce congestion. The difficulty is moving cars, growing out of the repeated snows and the icy sleet which was the latest variety of precipitation, has not been overcome, however, and returns of empties to the mines are negligible.

Severe weather has also returned, after a slight period of comparatively mild temperatures, and the domestic and industrial demand for coal has therefore been virtually at the top. Many manufacturing plants have been compelled to close down on account of inability to secure fuel, this being especially true on Friday and Saturday, following a sudden flood stage of the Ohio River on account of damming by ice. Many coal companies with plants on the river front were thus put out of business for the time being, and in some instances cars of coal on railroad tracks were also caught by the river.

LOUISVILLE

Marked improvement in Kentucky field and market due to better weather conditions. Industrial demand large and offerings few, but trade making progress and outlook encouraging.

A week of fair weather, with temperatures either mild or moderating, has been of invaluable assistance to the Kentucky coal producers and distributors. Temperatures have been below normal for the season, and the demand for all kinds proportionately increased, but, for all that, settled conditions of the railway lines, grounds about the mines and the roads and streets have done a great deal. This in the face of the fact that a larger volume of business is being done than usual for the season.

The disturbing feature of the immediate outlook is threatening flood-water. This may even inundate some of the workings, to say nothing of interrupting rail service through washouts and wreckage of bridges, while it has already put much of the river craft out of commission by sinking or damage. A slow, gradual thaw is all that will prevent serious floods, the river coal movement from western Kentucky points southward already having been affected.

There is considerable skeptical comment about the "heatless Monday" gains. However, most emergency needs are being taken care of and there are no reports of industrial plants in this section closing down for lack of fuel, while most of the coal concerns report that they have been able to take fairly good care of their customers. The retail coal situation throughout the section is also improved, in spite of the fact that high water has further reduced the supply of natural gas, and emergency measures are being discontinued.

BIRMINGHAM

Domestic trade conditions much easier as a result of continued mild weather and decreased consumption. Much steam coal goes to New Orleans for bunker use under orders of fuel administrator. Output affected by heavy rains and flooding of mines.

The domestic situation is now well in hand (thanks to the past two weeks of moderated temperatures) and with a continuation of favorable weather the yards will be able to stock against any future emergency conditions. Almost all the larger yards now have several hundred tons on hand for the first time in several weeks, and are filling all orders normally with the exception of the one-ton limit to each customer. Inventory of coal on hand in the yards of the Birmingham district at the close of the week showed 2536 tons as against 800 tons ten days ago. Also a much larger tonnage was reported in transit.

Restricted consumers of steam coal have felt the pinch in supply for the past 12 days on account of the order of district representative Holmes, of the fuel board, directing a large tonnage of Cahaba, Pratt and Black Creek steam coal to the port of New Orleans for bunkering ships at that point. This order had priority over all shipments of this grade of coal not consigned to public utilities and other preferred classes of consumers. The fact that the mines netted $1.35 per short ton over mine prices on all coal supplied for ship bunkerage rendered a more cheerful compliance with the priority order possible. The shortage in steam grades was accentuated to some extent during the severe cold weather on account of much mine-run coal being diverted to domestic channels.

Coke

CONNELLSVILLE

Coke shipments reach new low level. Additional transportation difficulties.

Coke shipments last week were the poorest thus far, probably running considerably under 200,000 tons. On account of a brief spell of moderate weather on Sunday the car supply for Monday loading averaged slightly above 40 per cent., but while the temperature passed above 40 degrees on Sunday it dropped to the neighborhood of zero in the night and the prediction is for continued cold, which, of course, means light car supplies for the remainder of the week.

Apart from car supply there are fresh transportation difficulties. The heavy snow storm in the East last Sunday week further retarded coke movement on the main line of the Pennsylvania and after four days' shipments had accumulated the Pennsylvania refused, beginning Friday of last week, to take any coke on the main line through the Pittsburgh and Latrobe gateways. The particularly unpleasant aspect of this development is that it was only two or three weeks earlier that an interchange of coke had been effected to avoid certain cross movements, whereby coke reaching Greensburg and formerly passing to Pittsburgh had been exchanged so as to be shipped East on the main line. This arrangement had been expected to produce a general improvement, as it had had difficulty in getting through west of Greensburg. Now it is not even permitted to go East. There is an accumulation of at least 1000 cars on the Monongahela R.R., which the Pennsylvania cannot accept, at West Brownsville, and the Redstone branch is about equally congested.

The blast furnaces of the Central West that depend upon Connellsville coke are producing pig iron at about 25 per cent. of normal, though their coke consumption is greater than this, on account of banking, irregular operation and poor quality of coke. The byproduct ovens are operating at about 75 per cent., every effort being made, at the instance of the authorities at Washington, to get coal to them, Washington being interested in the byproducts. The blast furnaces as a whole are operating at about 50 per cent.

There are practically no open market transactions, but considerable tonnages of coke are changing hands at the set prices, by reason of various redistributions arranged by the Fuel Administration, the set prices remaining at $6 for furnace, $7 for 72-hour selected foundry and $7.30 for crushed, over 1-in. per net ton at ovens.

The Connellsville "Courier" was unable to report shipments for the week ended Jan. 19. Production showed a decrease of about 10,000 tons, to 221,000 tons.

Birmingham — Considerable tonnage of foundry coke continues to move from this district to the shipbuilding plants working on Government orders and to the railroads for foundry use at their shops—virtually priority business. As a result regular customers of district coke manufacturers are suffering some inconvenience by having their supply restricted. Transportation difficulties have been minimized to some extent by more liberal rulings on consignment of equipment placed for loading. Coke manufacture has suffered some the past week or so on account of the decreased output of coal due to excessive water in the mines.

Buffalo—Complaint from the direction of the coke trade is seldom heard. This is mainly on account of the fact that the bituminous shippers, who used to handle a great part of the output, have gone almost entirely out of that part of the trade, leaving the consumers to buy from the ovens direct. This is no doubt a better way of conducting the trade in such an emergency and it appears that it is fairly satisfactory, for the furnaces keep running on practically full time. The supply of ore is adequate and the coke finds its way to proper destination somehow.

Middle Western

GENERAL REVIEW

More snow tangles up rail traffic. Deliveries slow and uncertain. Many trains cancelled.

The latest heavy snow struck the Mid-West the first part of the week, and continued cold weather caused rail traffic to again become badly disorganized. It was also responsible for the annullment of many trains throughout this territory. The only fortunate feature about the latest storm was that it did not snow heavily in the coal-mining districts. This allowed mines to continue to hoist and load coal where equipment was to be had. Northern Illinois and southern Wisconsin suffered severely, as a result of the tieup of all kinds of transportation, including passenger trains.

Monday was observed as "fuelless day" with patriotic spirit and few complaints of violations have been noted. Saloons and cigar stands were the chief violators. The large industries did their bit manfully—hardly a wheel turning, according to reports received by the State Fuel Administrator's office, excepting in those plants that had been granted exemption. In most large towns, Monday appeared as Sunday, the only places open being hotels and drug stores.

The continued cry throughout the country for relief has had the effect of a concerted movement by the Fuel Administrators and coal operators of Illinois. At a meeting of the Fuel Administration and representatives of the Illinois operators, it was mutually agreed that the Fuel Administration would withdraw its order requiring 10 per cent. of the daily production and that the operators through a committee, would undertake to supply industries and dealers needs through the usual channels.

In order that there would not be any duplication of shipments the Distribution Committee urges that a report be made by all shippers of coal within the State of Illinois to the committee each day, giving the number of cars shipped, grade and to whom consigned. Such an arrangement, it is contended, will more nearly equalize distribution and prevent any one dealer or industry securing more than their share of the available shipments. The result of recent pooling is still tangled because of the different prices of coal that found its way into the pool. Some coal, shipped direct by the producers to their trade on contract, the price of which was in excess of that fixed by the Government, was taken. In many instances dealers contended that the Government price should be charged. However, the ruling of the Fuel Administrator allowed contract price to prevail, plus 15c. per ton, to cover cost of rebilling and replacement.

Production throughout Illinois and Indiana is still far below normal. However, a marked improvement over the previous week is noticed during the present week. In Williamson County, Illinois, it is learned from association secretary's report that mines worked approximately 69 per cent., while in Franklin County, 54 per cent. working time was recorded. This difference is no doubt occasioned by a large number of mines in the former county loading railroad coal, with a full car supply.

The seriousness of the fuel situation in Illinois would seem to warrant, at least temporarily, the application of all coal produced in the state to Illinois points exclusively. Regardless of this situation, an attempt was made Thursday by Fuel Administrators of Indiana and Ohio to confiscate 565 cars of coal that was delayed at Danville, Ill., because of the failure of the railroads to provide motive power. The coal was mostly billed to steel plants near Chicago.

The railroads claim that they would, if left alone, clear this situation up in 24 hr. State Fuel Administrator Williams immediately got into communication with Dr. Garfield, in an effort to prevent the raiding of Illinois, by neighbor states. It is understood that the request of Mr. Williams was not granted, and the 565 loads from the Danville district were allowed to move East to points along the Big Four R.R., where the needs are most urgent.

The labor situation throughout this section is in good shape. Operators say they are in a position to provide the coal if they can be furnished sufficient equipment.

CHICAGO

Chicago coal famine continues. Zero weather prevails.

There is little prospect for relief in sight. The fact that daily receipts are not of sufficient volume to take care of the distressing need, is evidenced by the increasing requests made on the City Fuel Administrators office for coal. Most retail yards are absolutely bare of coal, and the incoming shipments are quickly unloaded from the car and distributed to the most needy in small lots.

Although Monday was observed as a fuelless day, little or no change was noted so far as getting any coal ahead is concerned.

The board of education held a session during the week with a group of coal dealers who urged the further suspension of schools but the school board declined to listen to any proposition that would close the schools and permit saloons and poolrooms to remain open. The schools use 1200 tons per day and have only 6000 tons left in storage—five days supply.

State Fuel Administrator Williams has demanded of the coal operators a daily statement of the tonnage produced, giving the car numbers, kind of coal, to whom billed and the destination. The request is made through the Illinois operators distributing committee, which meets daily with some part of the fuel administration forces.

The Chicago Association of Railway Managers announced that Thursday 210 cars of anthracite, 1789 cars of bituminous and 114 cars of coke arrived at Chicago. Two hundred and twenty seven cars were delivered to industries, 350 to team tracks 330 to yards and 692 cars of coal were unloaded, while 1587 cars were held for consignment.

Outside of hard coal and Illinois bituminous, this market is receiving but little fuel. It is now the conviction of the producers particularly those that have their head offices in Chicago that there is no remedy that can relieve the present situation except warm weather.

Prices are as given in the table below.

MILWAUKEE

Transportation and delivery the chief problems. City well supplied, but interior communities are hard up for fuel. Price schedule continues unchanged.

Transportation and delivery are about the only problems which face Milwaukee coalmen at this time. There is coal sufficient to last until spring, if proper care is taken. Hard coal is nearly gone, however, and more soft coal is being used by private consumers than ever before. There has been no change in the price schedule since the increase of 75c. ordered on Jan. 20 to cover growing delivery expenses due to the one-ton allotment and snow blockaded streets.

The coal supply in some Wisconsin cities and towns is practically exhausted because of inability of Milwaukee shippers to get cars enough to meet the demands upon them. Madison was a sufferer, but Gov. Philipp took a hand in the matter and secured thirty carloads of coal from Superior, Wis., by special train. La Crosse is in a bad way for fuel and it is said no more hard coal will be shipped to that point this winter. Emergency shipments were made to Watertown, Waterloo, Sun Prairie and Marshall. At these places coal was being doled out to consumers in bushel-basket lots. The Milwaukee road had not sufficient coal to run all of its freight engines on the Madison division. Milder weather and a let-up in the rail congestion will result in prompt replenishment of fuel supplies all over the state.

The University of Wisconsin is now saving 161 tons of coal each week as a result of fuel conservation rules it has put into practice.

	Williamson and Franklin	Saline and Harrisburg	Fulton and Peoria	Springfield	Carterville	Grundy, La-Salle, Bureau and W.ll
Prepared sizes	$2.65@2.80	$2.65@2.80	$3.00@3.15	$2.65@2.80	$2.65@2.80	$3.35@3.50
Mine-run	2.40@2.55	2.40@2.55	2.75@2.90	2.40@2.55	2.40@2.55	3.10@3.25
Screenings and washed slack	2.15@2.30	2.15@2.30	2.50@2.75	2.15@2.30	2.15@2.30	2.85@3.00

	Clinton and Sullivan	Knox and Greene	Eastern Kentucky	Pocah. and W. Va.	Penna.	Hocking	West Va. Splint
				Smokeless			
Prepared sizes	$2.65@2.80	$2.65@2.80	$3.10@3.25	$2.60@2.75	$2.60@2.75	$3.05@3.20	$2.85@3.00
Mine-run	2.40@2.55	2.40@2.55	2.85@3.00	2.45@2.60	2.45@2.60	2.70@2.85	2.60@2.75
Screenings	2.15@2.30	2.15@2.30	2.60@2.75	2.10@2.25	2.10@2.25	2.55@2.70	2.35@2.50

ST. LOUIS

Current needs about taken care of, but St. Louis is 95 cars per day short of requirements. Railroad service extremely poor, especially on the Illinois Central. Terminal unable to cope with conditions. Country situation acute. This cannot be relieved unless weather becomes warmer.

The St. Louis situation, while a trifle better, is still somewhat acute. Extremely cold weather and the continued storms have kept the railroads in a precarious condition, and the Terminal situation is extremely bad.

The Terminal contrary to instructions has placed temporary embargoes against the Wabash, C. & A. and Rock Island, on lines west of the river. When this was brought to the attention of the Fuel Administration it was ordered raised.

If coal was moved in and around St. Louis by the Terminal as it should be, the situation would be from 10 to 20 per cent. better than it is, but the utter demoralization of the Terminal and some of its connecting lines is the principal cause of the coal shortage in this city.

Steam plants are receiving enough to get along on by the closest kind of economy, but a survey of the coal requirements of the city show that the daily shortage here is 95 cars. Eight hundred and sixty-four firms in St. Louis show requirements of 1450 cars a week, but the requirements for St. Louis including steam and domestic are about 550 cars per day and about 450 cars per day have been coming in.

Essential industries manufacturing food stuffs and working on war contracts number 243 and use 12,360 tons of coal a week. Firms claiming to be essential number 227 and use 14,550 tons a week.

The dealer demand in St. Louis is between 250 and 300 cars per day. There has been considerable trouble here on account of dealers and others violating the priority rule in the distribution of coal. The Union Electric Light and Power Co. investigation developed the fact that it was heating about 140 plants and that 8 of these had generators but the remainder were straight heating plants and were getting coal in preference to domestic users, although most of these plants were in wholesale houses and office buildings.

The situation in the Carterville district continues to be a serious one as far as this market is concerned. The Fuel Administration for Illinois, or rather the assistants therein, are draining the Carterville district in favor of Chicago and are neglecting contracts and trade in the territory west of the river. For that reason practically no Williamson or Franklin County coal is coming in. The same condition applies to the Duquoin district to some extent.

Working conditions in these fields are not good, one big mine getting 34 hr. work on commercial coal in a period of one week. The railroads seem to be getting most of this coal, and the Government requirements come next.

In the country districts the situation has been most acute in southeast Missouri and northeast Arkansas, which sections have in the past depended upon the Carterville field. Many of these places have no rates from the Standard field and are entirely without fuel. Sections that can be reached by Standard coal are being taken care of under the direction of Fuel Administrator Crossley, who in three days shipped 73 cars of coal to these points and coal is going forward now at the rate of from 15 to 20 cars per day to sections that in the past have never used Standard coal.

On the Iron Mt. lines in Arkansas and Louisiana there is much actual suffering as well as in some isolated places in Missouri.

The prevailing market per net ton f.o.b. mine is:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump	$2.65@2.80	$2.65@2.80	$2.65@2.80
3x6-in. egg	2.65@2.80	2.65@2.80	2.65@2.80
2x3-in. nut	2.65@2.80	2.65@2.80	2.65@2.80
No. 2 nut	2.65@2.80	.....	.....
No. 3 nut	2.65@2.80	.....	.....
No. 4 nut	2.65@2.80	.....	.....
No. 5 nut	2.15@2.30	.....	.....
2-in. scrgs	2.15@2.30	2.15@2.30	2.15@2.30
2-in. lump	.....	.....	2.65@2.80
3-in. lump	.....	2.65@2.80	.....
Steam egg	2.65@2.80	2.65@2.80	2.65@2.80
Mine-run	2.40@2.55	2.40@2.55	2.40@2.55
Washed:			
No. 1	$2.65@2.80	$2.65@2.80	.....
No. 2	2.65@2.80	2.65@2.80	.....
No. 3	2.65@2.80	2.65@2.80	.....
No. 4	2.65@2.80	2.65@2.80	.....
No. 5	2.15@2.30	2.15@2.30	.....

Williamson & Franklin Co. rate is...87½c.
Other fields .....72½c.